

THE IRON AGE

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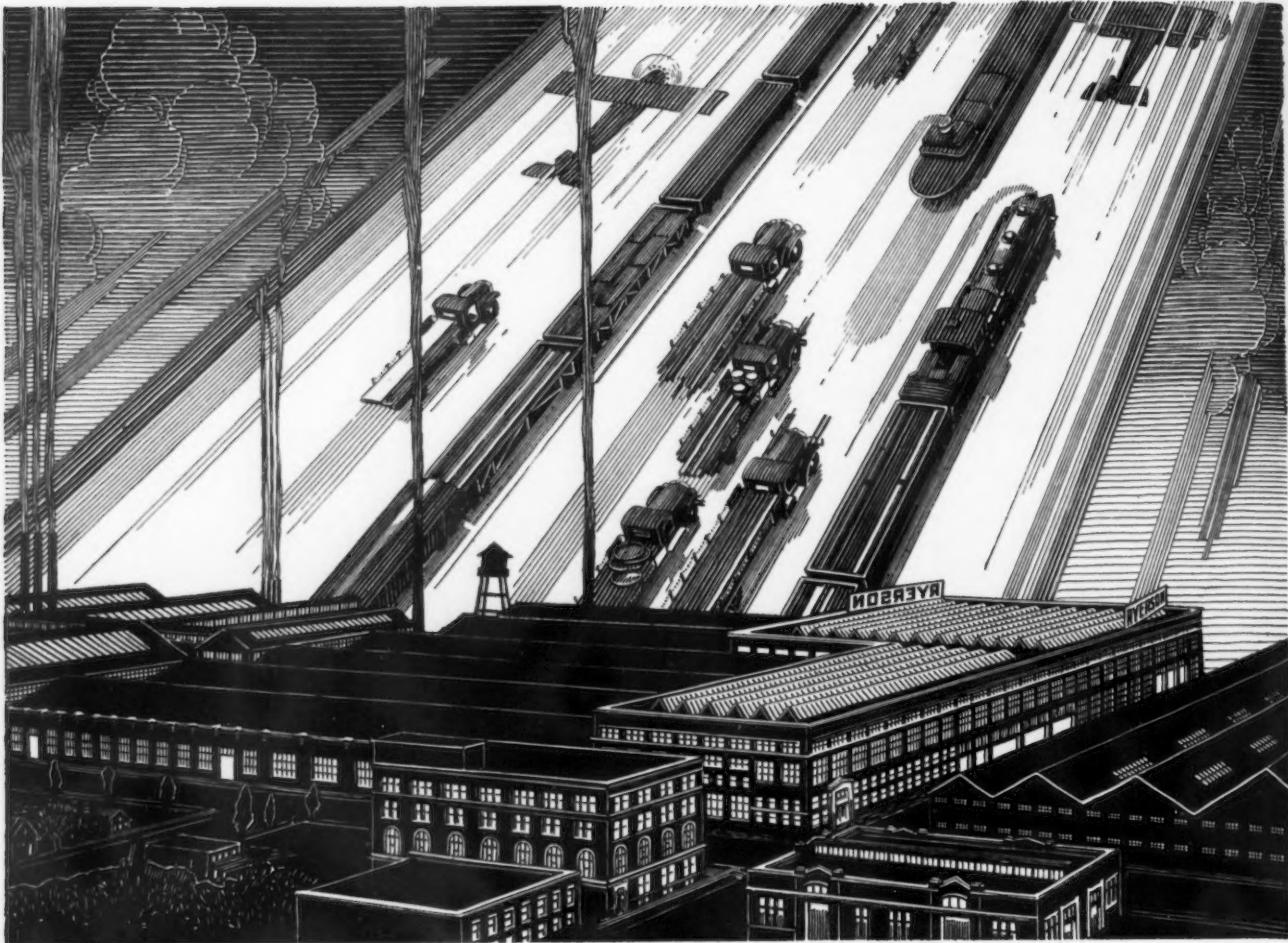
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... THE IRON AGE ...

MARCH 21, 1935

ESTABLISHED 1855

Vol. 135, No. 12

"Blessed Are the Peace-Makers"

HERE is a good old formula which is still in use in American industry and which has enabled it to make a remarkable showing under the most adverse conditions it has ever met. That formula is: Avoid trouble, but when you cannot avoid trouble, eliminate it.

The application of this formula starts with design and applies through production clear down to the disposal of the product. It applies to the relations of machine elements to one another and also to the even more important relationships between men.

Capable management recognizes that excessive friction, either mechanical or human, will ruin the operation of any mechanism or any organization. Gears must work together, not fight each other, and so too must men if one is to have a successful plant operation and avoid a disastrous smash-up.

It is because of a clear realization of the truth of this basic principle that the majority of employers are averse to unionization of their plants along the A. F. of L. or other professional union lines. The philosophy of such unionization is not based upon peace and good will; it is frankly founded upon the acceptance of the principle of class antagonism and mass opposition. At best it leads to nothing better than an armed neutrality in which suspicion stalks about constantly with a chip upon its shoulder.

The formula which professional labor leaders have found so personally profitable to follow is just the opposite of management's formula. It is this: Seek trouble and capitalize it. If you cannot find trouble, create it.

Unfortunately, this destructive formula is now being borrowed and applied in broader fields than that of industrial relations. The Longs and the Coughlins and others of their ilk are putting it to work effectively to gain huge personal followings.

What such capitalization of trouble will do to the big economic machine, of which our individual industries are coqs, is a serious question. Certainly the mass cultivation of hatreds will not lead to peace.

We recall that the One who drove the money changers from the temple also blessed the peace-makers and the meek. Trouble-makers were not included in his benediction.

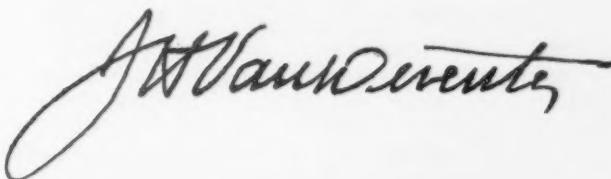
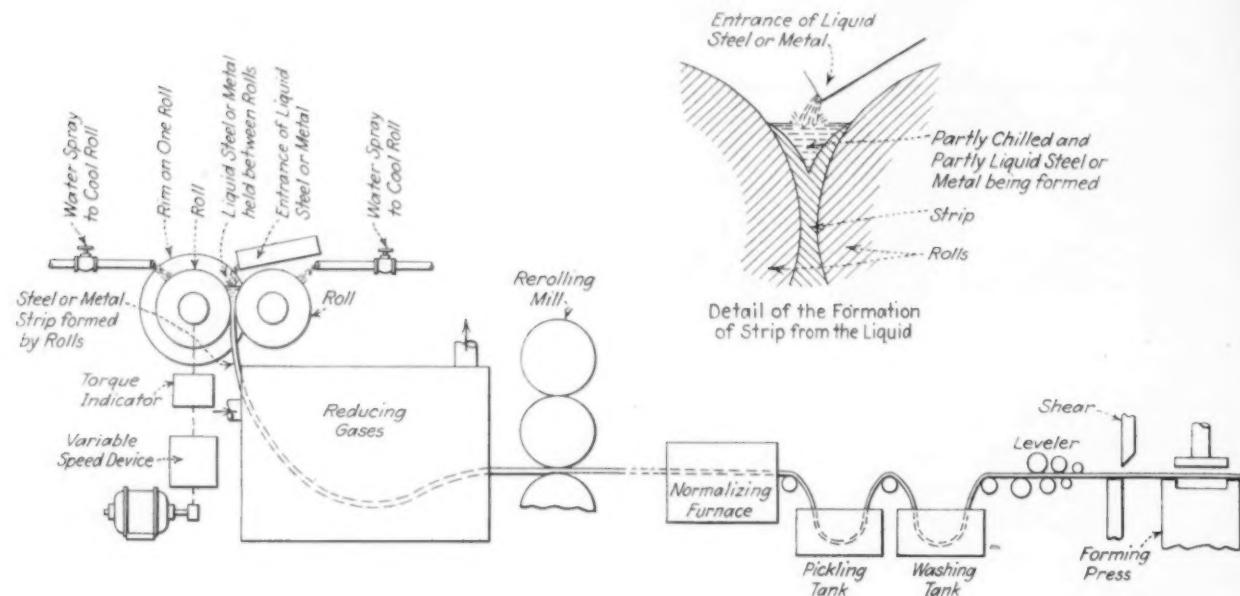


FIG. 1—Experimenters are currently mostly concerned with refinements in the direct rolling machine to the left. As soon as steel is in commercial production by means of this direct rolling unit, it is entirely possible that the subsequent operations indicated at the right will be incorporated as a continuous unit. The detailed drawing below portrays the formation of the steel or metal strip between the revolving rolls.



DIRECT ROLLING

An Actuality With Metals—

A Possibility With Steel!



THIS age has been given many descriptive or qualifying appellations—the machine age, the steel age, the alloy age, the mechanical age, etc. Any or all are justifiable and appropriate, but just as warrantable is its designation as an age of continuous processes.

The efforts of all manufacturers are directed toward transforming the independent units of their plants into straight-line installations, wherein raw materials flow

By T. W. LIPPERT
The Iron Age, New York

tries which have been notable for their lack of respect for precedent.

But the steel and non-ferrous industries, despite their preeminence in America's industrial scheme, have progressed more slowly than a number of other lines in technical developments and therefore have been charged, whether rightly or wrongly, with failing to keep pace with the tempo of a modern age. It is a common comment that the whole process of steel making is fundamentally unchanged from a decade ago, that its melting

in at one end and finished products drop off a conveyor at the other end. The constant effort to achieve this ultimate ideal is all to the end of lowering costs, increasing efficiency, and obtaining uniformity of product. Such results have been secured by some indus-

technique is highly inefficient, that the production and treatment of semi-finished steel are devious and costly, that finishing operations are lengthy and complex.

Admittedly the research laboratories of steel mills have turned out quantities of instructive data on fundamental problems and have also had a degree of success in the development of new alloys and special steels. However, it is pointed out that no radical changes have been made in the methods of melting and forming of steels. The blast furnace and open-hearth processes are condemned as wasteful, and changes in these units are dismissed as being limited to minor improvements in construction and in routine details of operation, all of which are along lines of practice laid down decades ago.

These familiar criticisms must now cease, for it can no longer be said that nothing radical is being attempted in the technique of metal production. The inventive genius of one man has long been focused on a revolutionary method of rolling and, with extensive cooperation from engineers of several American companies, he has developed a process which ultimately may result in far-reaching changes in the steel and non-ferrous metal industries.

Produces Steel Directly

One of the commonest objections to current practice is that liquid steel is frozen into solid masses before it is rolled into finished products. When the molten metal is cast into large ingots, which cool slowly, the originally homogeneous liquid metal is far from homogeneous by the time it has solidified. The imperfections directly traceable to the casting and freezing of the ingot remain in the metal through all subsequent rollings.

It has, therefore, often been asked why the steel industry cannot emulate the prominent automobile manufacturer who showed the world it was possible to make plate glass from a continuous stream of molten raw product.

The same thing has been done with steel! And the same thing is in commercial production with non-ferrous alloys having a lower melting point than steel. The following description of this revolutionary process of direct rolling of metals

and steels is the first to appear in the American or foreign press. Much secrecy has been (and is) thrown around this method, mostly as a protection against over-publicity, which is often dangerous to a new and basically different idea.

Consider the sketch in Fig. 1. Two rolls, water cooled, support a quantity of molten metal. As the rolls rotate, a continuous strip of metal is formed if *all the delicate balanced conditions are favorable*. The speed and separation of the roll, the static pressure and temperature of the metal, the temperature of the rolls, the metal itself, are all variables which must carefully be controlled if success is to be achieved. When all these conditions have been satisfactorily adhered to, the emerging strip can immediately be further reduced by hot rolling, after which the usual physical properties can be secured by conventional cold rolling.

Although the operation is considerably more complex than indicated in Fig. 1, the sketch does give a

fair idea of the process. So far the procedure has only been carried to the formation of strip from the liquid phase. The continued procedure thereafter, as indicated in the sketch, is a development for the future. That is, it is entirely possible to take the freshly formed strip through reducing gas and re-roll it before it cools. It may then be normalized, pickled, washed, leveled, sheared, and finally formed in a press—all in one continuous operation.

Oddly enough, the temperature of the rolls is kept near 200 deg. C. by means of water sprays. Not a great deal of heat is taken from the metal or steel—the skin of the strip is chilled, whereas the interior may be quite hot. For casting metals the hollow rolls are made of copper, but for rolling steels they are solid steel forgings or castings. The contact with the molten steel naturally causes some fire cracking of the rolls; therefore they must occasionally be removed and redressed.

FIG. 2—One of the experimental machines, which is continuously casting 36-in. lead strip at the rate of over a ton per minute. This mill is now being revamped in order to cast stainless and common steels.



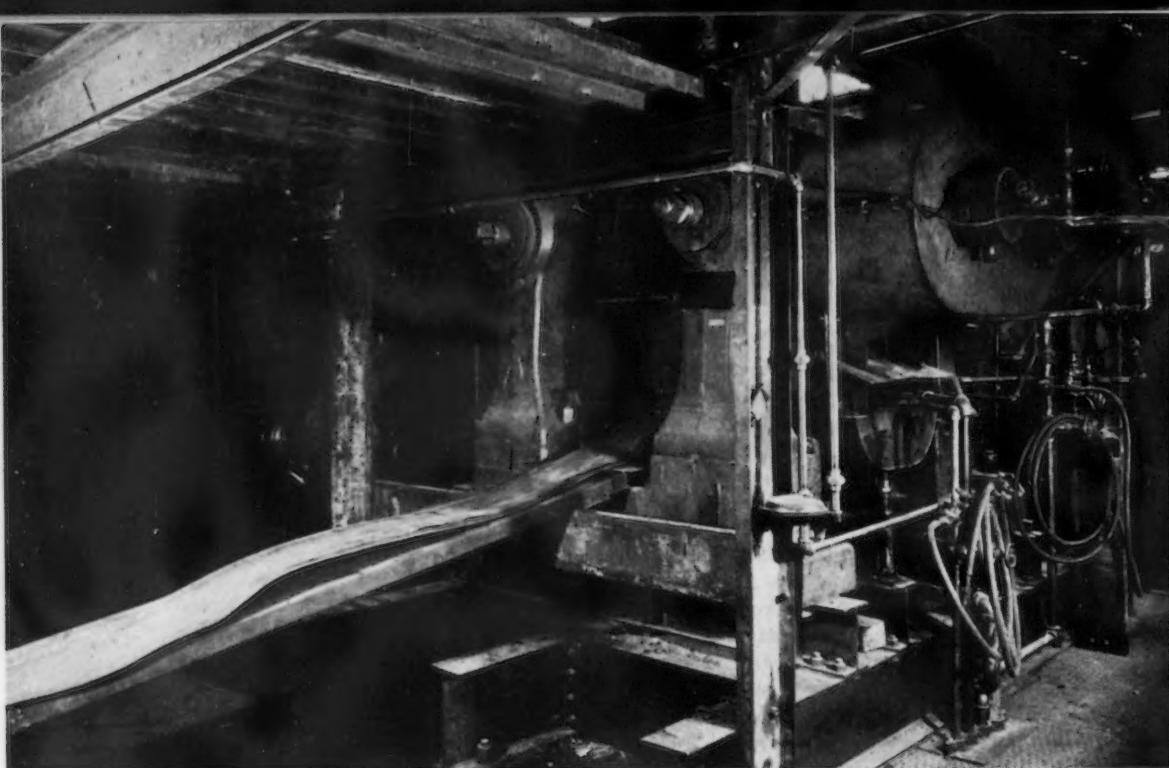


FIG. 3—The delivery end of a brass casting and rolling machine which is now in daily commercial operation. This unit turns out about 200 lb per minute of 12-in. brass strip 0.150 in. thick. The metal is poured into the rolls from the platform above, as shown in Fig. 4.

The implications of this process are startling. If and when completely successful with steel, it will mean elimination of ingot casting, soaking pits, blooming mills and breakdown mills. It will mean a much cheaper product and a much smaller capital investment for the steel industry or for steel consumers for each ton of steel produced.

First Success Obtained With Metals

In developing such a method as this, the natural approach is to produce non-ferrous metals first. This follows from the fact many metals have lower melting points and are much easier to work than steel. Also, their simple structures permit easier and more satisfactory formation.

The direct method is now dis-

tinctly successful with brass (melting point at 940 deg. C.) and with copper (melting point at 1083 deg. C.). A new unit is now in experimental production for the direct rolling of metals with melting points up to 1500 deg. C., and some degree of success has been secured with the plain and complex steels (melting points from 1400 to 1500 deg. C.).

One of the original casting machines is shown in operation in Fig. 2. This machine has turned out over a ton of 36-in. strip of a low melting point metal each minute. This same unit is now being converted for the rolling of steels, both plain and complex.

An outgrowth of this experimental machine is the commercial unit shown in Fig. 3. This diagonal view shows the delivery of the 12-in. brass strip, and also illus-

trates the gas and water connections. The pouring platform of this machine is shown in Fig. 4. The brass melting furnace is in the background, and the one flanged roll of the casting machine is clearly visible in the center foreground.

No annealing of this machine cast and rolled brass is required, and the coils are immediately ready for cold rolling. Inasmuch as the material is best coiled as it comes from the liquid rolling machine, it is in a condition most suitable for cold reduction on tension-type cold-rolling equipment.

Many coils of this material have been so reduced to various gages, including 0.011, 0.015, 0.020 and 0.029 in. There are no special problems involved in cold rolling—the machine cast and rolled product acts satisfactorily during the reductions and requires no intermediate annealing. Many tons of this cold-rolled brass have already been further processed into consumer products and sold on the market along with articles produced from brass cast and rolled in the conventional manner.

That this brass casting and rolling machine produces a superior product is best illustrated by data secured in the plant of the principal maker of this product. Numerous comparative tests have been made of the metallurgical and physical properties of special common high brass produced by the regular chill cast process, as

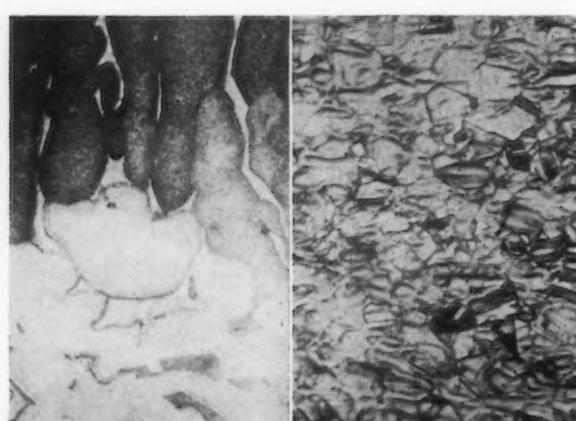


FIG. 5—High purity brass cast by the regular chill cast method is shown to the left. At the right is the same brass as produced by the continuous casting machine. Magnification equals 250 diameters, etched with $\text{NH}_4\text{OH} + \text{H}_2\text{O}_2$.

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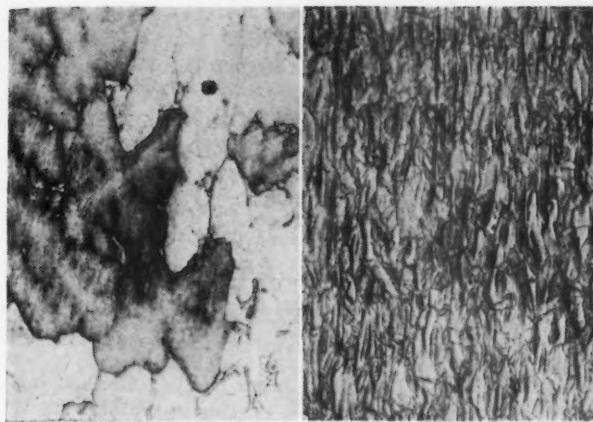


FIG. 6—Comparison of regular chill cast brass (left) and machine cast brass (right) after having been reduced 25 per cent by cold rolling. Regular cast specimen at 75 diameters and machine cast specimen at 250 diameters. Both etched with $\text{NH}_4\text{OH} + \text{H}_2\text{O}_2$.

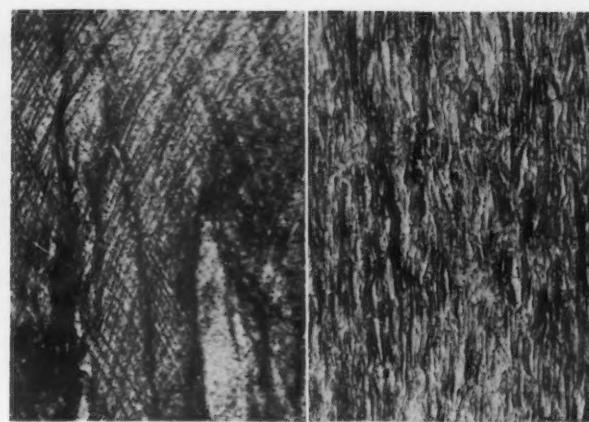


FIG. 7—Comparative views of high purity brass, cast by the conventional chill method (left) and by the continuous casting machine (right), after cold reduction of 50 per cent. Both at 250 diameters. Etched in $\text{NH}_4\text{OH} + \text{H}_2\text{O}_2$.

against the product turned out by the casting machine. A special common high brass used in both processes is of high purity and is made from selected scrap. The approximate composition is 64.5 to 66.5 per cent copper, 0.07 maximum lead, 0.03 maximum of iron, and the balance of zinc.

The following samples were removed and examined from *regular chill cast brass*: (a) from regular cast bar cut far enough back from the gate end so that the bar was sound and free from gas pockets or dirt inclusions, (b) the same bar following a 25 per cent rolling reduction without an anneal, (c) the

same bar after it had been rolled 50 per cent without any anneal. A composite analysis of these three samples gave 65.54 per cent copper, 0.003 of lead, 0.01 of iron and 34.447 of zinc.

For comparative purposes, the following samples were taken from brass strip produced by the *continuous casting machine*: (a) from the center of the strip "as rolled" by the machine, (b) the same sample reduced 25 per cent by rolling and without any anneal, (c) a sample rolled 50 per cent, also without any anneal. A composite analysis of these three samples gave a composition of 66.82 per

cent copper, 0.037 of lead, 0.02 of iron and 33.123 of zinc.

The comparative structure "as cast" by each process [(a) for each case above] is well demonstrated in Fig. 5. Note that the regular cast specimen has a typical cast dendritic structure with beta surrounding the alpha crystals. On the other hand, the structure of the machine cast brass shows a typical hot-worked arrangement consisting of equiaxed twin crystals.

The micrographs in Fig. 6 show the comparative structures of these two differently processed brasses after they had been reduced to

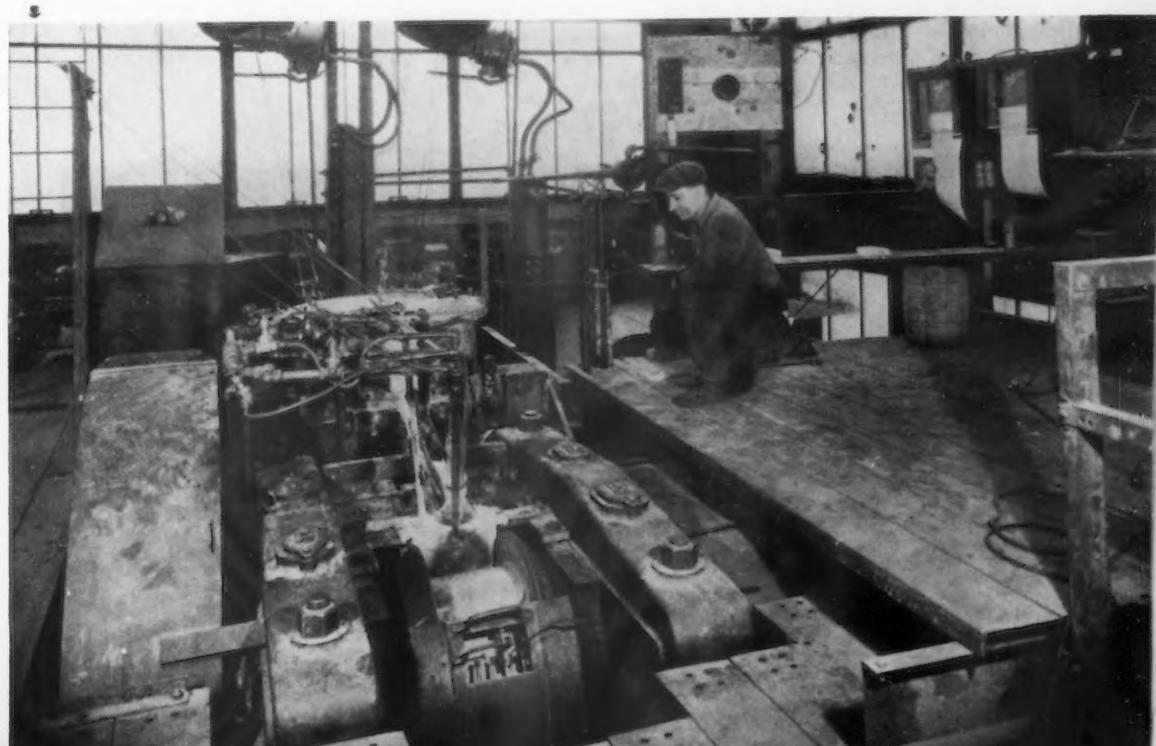


FIG. 4—The pouring platform of the commercial brass casting and rolling machine. Note the brass melting furnace in the center rear, and the flanged roll of the machine in the center foreground.

TABLE I—Physical Properties of Brass as It Emerges From the Continuous Casting Machine

Description	Dimension in Inches	Area in Sq. In.	Yield Point, Lb. per Sq. In.	Tensile Strength, Lb. per Sq. In.	Elongation, Per Cent in 2 In.
No. 1—Longitudinal	0.499 by 0.133	0.06637	21,800	50,900	58.0
No. 2—Longitudinal	0.496 by 0.137	0.06795	21,200	49,900	55.0
No. 3—Longitudinal	0.501 by 0.132	0.06613	21,200	49,300	46.0
No. 4—Transverse	0.501 by 0.129	0.06463	22,100	49,700	33.0
No. 5—Transverse	0.503 by 0.132	0.06640	21,800	50,300	38.0
No. 6—Transverse	0.502 by 0.129	0.06467	22,100	48,900	31.0

0.938 in. in thickness, or 25 per cent reduction, by cold rolling. Likewise Fig. 7 shows the comparative structures after the material had been reduced to 0.625 in. in thickness, or 50 per cent reduction, by cold work.

By means of these microphotograph examples it is clear that brass produced by the continuous casting machine is entirely different from brass processed by the conventional chill cast method. The machine cast brass has a structure identical with that of hot-rolled brass or chill cast brass which has been homogenized by subsequent cold rolling and annealing. That is, the machine produces 0.125-in. thick brass in one quick, continuous operation which is entirely equivalent to metal produced by ordinary mill methods and subjected to a series of treatments, consisting of overhauling, annealing and cold rolling, to homogenize the structure of the metal.

To show one slight difference between the machine-processed material and conventional chill cast material, sets of longitudinal sections were taken from sheets, as illustrated in Fig. 8. The microphotos in Fig. 9 are of the three different specimens cut from the

center of brass sheets rolled by the continuous casting machine. This sheet was 12½ in. wide by 0.125 in. thick. The angularity in microstructure near the surfaces of the sheet is clearly discernible.

For comparison, similar samples of completely processed brass produced by the regular chill cast method are shown in Fig. 10. These specimens were taken from a regularly cast 11-in. by ¼-in. bar, after it had been cold rolled to 0.625-in. thickness, annealed at 680 deg. C. for 2 hr., then cold rolled to 0.250 in. and annealed at 520 deg. C. for 2 hr., and then cold rolled to 0.125-in. thickness and annealed at 400 deg. C. for 2 hr. The structure represents typically annealed alpha brass.

Physical Properties Very Satisfactory

It is interesting to examine data on the longitudinal and transverse physical properties of brass in the condition in which it emerges from the continuous casting machine. The yield points, tensile strengths and elongations of various sizes of specimens are given in Table I. Note the extreme uniformity of the tensile strength and yield point of this machine

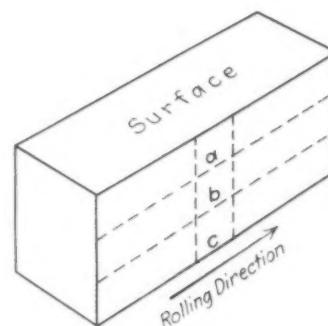
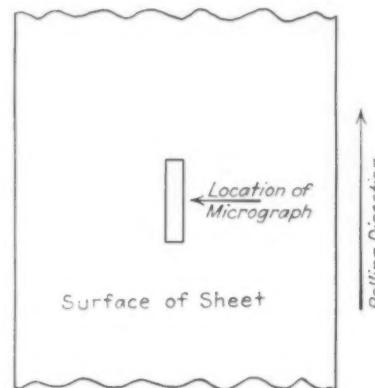


FIG. 8—Showing the location of longitudinal samples taken for micrographic studies of the structure of machine cast brass and conventional chill cast brass.

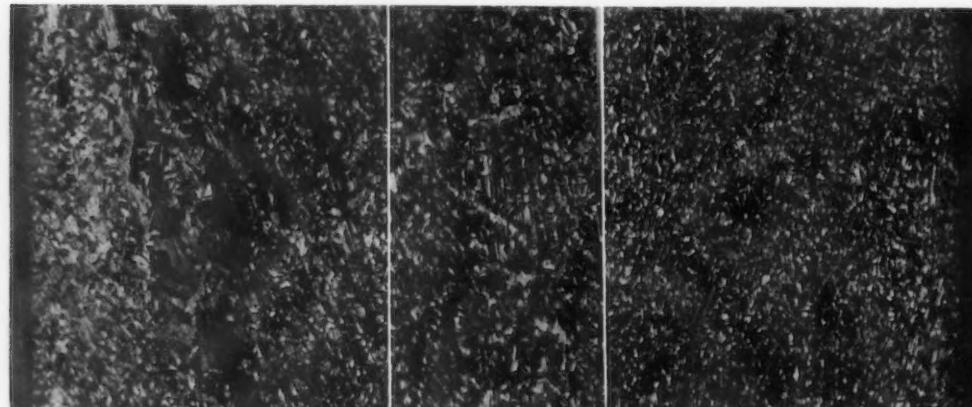


FIG. 9—Microstructures of high purity brass as rolled on the continuous casting machine. The locations of the longitudinal samples are shown in Fig. 8. Reading from left to right is specimen (a), (b), and (c), respectively. Note the angularity in microstructure near the surfaces of the sheet. At 75 diameters, and etched with $\text{NH}_4\text{OH} + \text{H}_2\text{O}_2$.

cast material. The grain size and physical properties correspond to those of regular chill cast brass which has been rolled and fully heat treated by the regular mill schedule, and finally anneal-tempered at 375 to 425 deg. C.

An indication of the extreme ductility of this machine cast brass is best shown by the data in Table II. The material tested was taken directly from the continuous casting machine and cold reduced from 0.125-in. thickness in a tension-type cold rolling mill. The width of the sheet produced was about 11½ in.

From all these data on the properties of continuously cast brass, it is apparent that the advantages of this method as compared with the regular standard practice are as follows:

(1) The saving of all the labor and other expense involved in rolling and annealing the material from the conventional cast bar 1¼ in. thick or thicker down to 0.125 in. thickness.

(2) Ductility and soundness of the metal, which are superior to that produced by regular mill practice.

(3) It lends itself admirably to large unit operation. A sheet of metal weighing 7000 to 8000 lb. can be continuously processed direct from the casting machine through the operations of slitting, rolling, annealing and coiling.

This extensive description of the casting of brass by machine was made because the data presented are the first ever made public, because the brass rolled in this manner is the first metal to be so processed, because the results obtained are conspicuously successful, and because the experience gained with this machine has opened the way to direct rolling of other metals, and ultimately the

TABLE II—These Data Demonstrate the Extreme Ductility of Brass Rolled by the Continuous Casting Machine (After Cold Rolling)

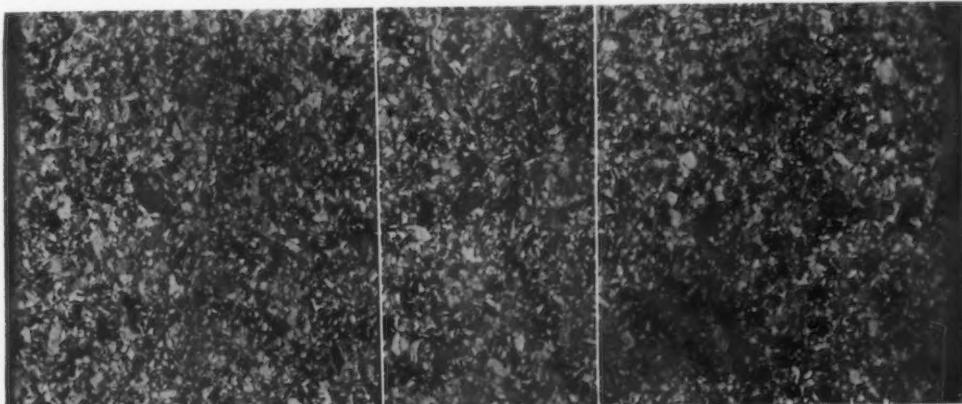
Description of Specimen	Grain Size	Gage in Inches	Tensile Strength, Lb. per Sq. In.	Elongation, Per Cent in 2 In.
No. 1—Longitudinal Transverse	0.040 MM (Hard Worked)	0.039	101,300	3
			110,300	4
No. 2—Longitudinal Transverse	0.035 MM	0.032	104,700	2
			115,700	2
No. 3—Longitudinal Transverse	0.038 MM	0.032	106,500	2
			114,900	2
No. 4—Longitudinal Transverse	0.040 MM	0.078	86,400	6
			93,300	7
No. 5—Longitudinal Transverse	0.055 MM	0.080	86,700	6
			89,800	7
No. 6—Longitudinal Transverse	0.050 MM	0.078	86,000	6
			88,300	6
No. 7—Longitudinal Transverse	0.040 MM	0.045	99,300	4
			106,500	4½
No. 8—Longitudinal Transverse	0.045 MM	0.075	88,500	6
			95,500	6
No. 9—Longitudinal Transverse	0.050 MM	0.048	97,600	3½
			104,800	5½
No. 10—Longitudinal Transverse	0.045 MM	0.044	102,600	2½
			108,600	3

probable commercial rolling of steel in this manner.

That the many difficulties attendant upon the rolling of higher melting-point metals are being

solved is best exemplified by the machine shown in Fig. 11. This large and impressive unit shows promise of commercial operation for the direct rolling in the rea-

FIG. 10—Structure of regularly chill cast brass, cold rolled and heat treated as stated in the text. These three specimens were cut from a sheet as shown in Fig. 8, and are shown here as (a), (b), and (c), from left to right respectively. These views at 75 diameters represent typical annealed alpha brass. The grain size is 0.024 MM.



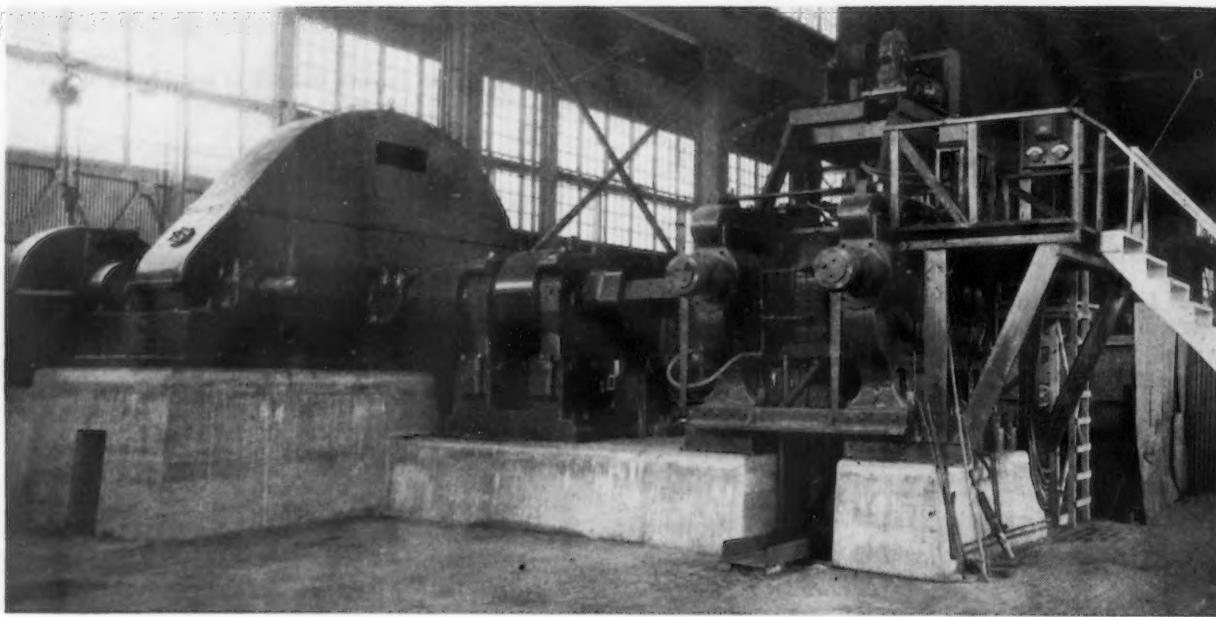


FIG. 11—This large casting and rolling mill, recently completed, is being used for developing the direct rolling process for metals pouring up to a temperature of 1600 deg. C. The pouring station is on the platform above, and the strip emerges from the chute at the base of the machine. All of the more important non-ferrous metals have been rolled on this type of machine with very promising results.

sonably near future of pure metals pouring up to 1600 deg. C. This unit will turn out strip 0.1 to 0.140 in. thick in various widths, depending on the rolls being used. Considerable success has already been achieved by the owners of this machine.

Since the metal rolled on the machine in Fig. 11 has a melting point in the neighborhood of that for steels, it would seem that the problem of direct rolling of steel will soon be solved. However, the complete solution of the problems encountered in the direct rolling of

steel are far from as simple as they might appear at first glance.

To turn out even mediocre steel strip by this method has necessitated the solution of many perverse and unexpected difficulties in mechanics, materials, thermal equilibrium and heat flows. The problem of securing satisfactory steel structures has been the bane of many experimenters with this type of equipment, but sufficient refinement has lately rewarded their efforts to cause one company to order a large machine and plant to be built for this purpose. This mill

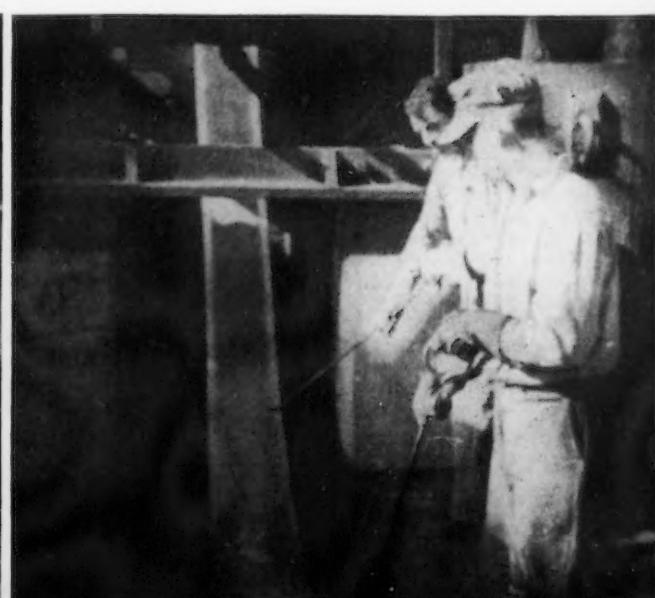
will be in operation within the year, after which time it will be possible to make a satisfactory estimate of the type of steel so produced.

It is within the line of good reasoning to state that the future may witness the elimination of ingot casting, soaking pits and blooming mills for the production of certain grades of steel. The direct rolling machine is comparatively inexpensive, and the results so far obtained show that it may be the instrument for quantitative, cheap and labor-saving production of

FIG. 12—The first step in the direct rolling of stainless steel. A ladle is being emptied into a runner leading directly to the turning rolls.

• • •

FIG. 13—A hot strip of stainless 18-8 steel is shown here emerging from the rolls.



steel. It is the most simplified set-up possible, as it is the means of transferring molten steel directly to a usable form without any intermediate, time-consuming and costly manufacturing operations. Also of importance is the element of safety in this direct rolling method. There is nothing in the process dangerous to the operators, despite the false rumor circulated in Europe that one man had been killed in this country while working on the machine.

It is of interest to examine the experiments of one company with the direct rolling of steel. These experiments are typical of results obtained by several other American mills. Oddly enough, much of the research has been performed with stainless steels, Monel metal, etc., all of which are difficult to roll satisfactorily in the conventional manner. Quite desirable stainless steel has been produced by this direct rolling machine in experimental batches. Likewise plain carbon steels have been turned out in small quantities.

It might be pointed out that as far back as 1865, Henry Bessemer predicted to the British Iron and Steel Institute that this direct method would eventually be used for the production of steel. In fact, Bessemer's patent sketches of such a machine appear quite similar to the present-day unit. One great difference exists, however. Bessemer's machine did not work, whereas the unit which has been described herein does operate with conspicuous success. Naturally all the phases of this new machine have been patented in this and all foreign countries.

To show the recent success with direct rolling of stainless steel, con-

sider Figs. 12 to 14. These views show the steps for forming the steel strip from the liquid state in one operation. Microphotos of this steel show a satisfactory structure.

In Fig. 15 is shown an alloy metal specimen taken directly from the strip produced by the casting and rolling machine. Note the cupped portion which demonstrates its ductility.

Conical Roller Bearings for Boulder Dam Gate Hoists

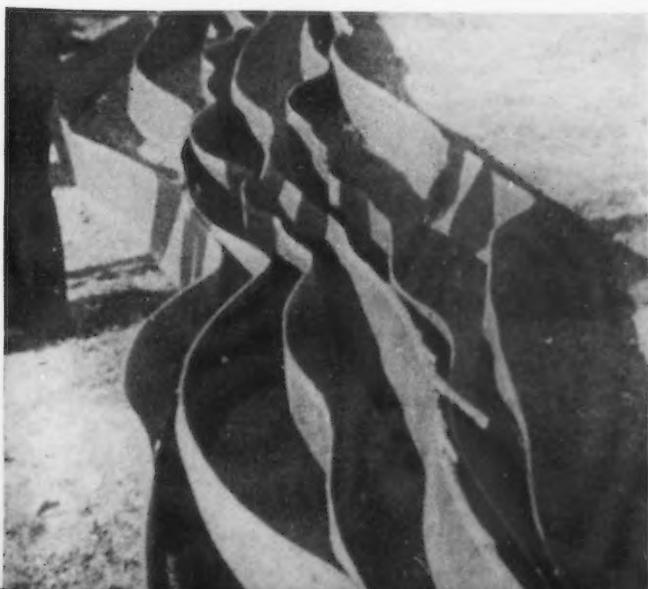
BANTAM BALL BEARING CO., South Bend, Ind., has been awarded the contract for the conical roller thrust bearings, together with alining seats on the cylinder gate hoists for the four intake towers at Boulder Dam, through the general contractor, the Consolidated Steel Co., Los Angeles.

These bearings will support the two bronze lifting nuts which engage the threaded ends of the stems to raise and lower the upper and lower cylinder gates respectively, and are 14-in. I.D. by 24½-in. O.D. by 4 9/16 in. thick and have a load-carrying capacity of 1,000,000 lb. at operating speed. Rollers and races are of S.A.E. 52100 high carbon chromium through-hardened steel, heat treated by the company's differential hardening method. One-piece lubricating type bronze cages are used for retaining the rollers.

One gate hoist will be mounted on the floor of each of the four intake towers and will operate separately or simultaneously the two cylinder gates installed in each tower. The cylinder gates will be mounted one above the other in the vertical shaft of each intake tower and will be used as shutoff gates for the 30-ft. diameter penstocks.

extending from the base of each tower to the power plant and outlet works. The upper and lower gates will be approximately 190 ft. and 340 ft. respectively below the intake tower operating floor. The normal operating lift of each gate will be 9 ft., but a maximum travel of 11 ft. will be available to facilitate inspection and maintenance of the gates when the gate chambers are unwatered.

The hoist drive will consist of a housing containing a central gear case in which will be mounted two separate gearing systems, each driven by a separate vertical gear motor mounted on the drive housing. Each motor will be coupled, through a multiple disk, spring-loaded clutch coupling, to a splined shaft on which will be mounted a miter gear which will drive three pinions, each connected through flexible couplings and shafting to a worm shaft mounting in each of the three hoisting head housings. Contact circuits will be provided whereby emergency closure of the cylinder gates can be accomplished by remote control from the power house, but normally the cylinder gates will be operated from the control panels mounted on each hoist drive housing.



AT LEFT

FIG. 14—Strip drawn from the machine and lying on the ground to cool. This quantity of strip represents about ten minutes production.

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AT RIGHT

FIG. 15—A section of alloy strip in the condition it came from the machine. The center portion has been cupped to demonstrate the ductility of the metal.



Metal Burial Vaults Are Flash Welded

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By F. L. PRENTISS
*Cleveland Resident Editor
The Iron Age*

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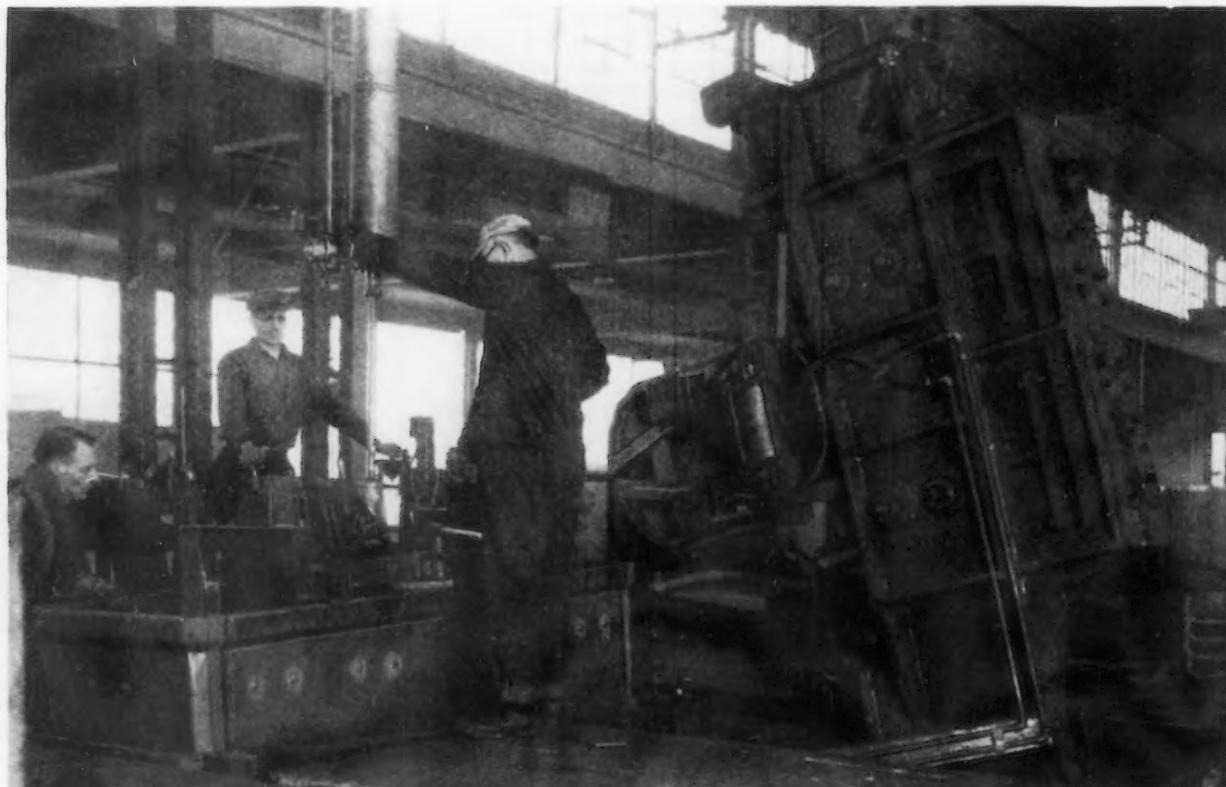
FLASH welding of burial vaults was one of the outstanding developments in the welding industry during the past year. A resistance welding machine, one of the most massive welders ever built, was designed for welding metal burial vaults on a mass production basis. One of these welders recently was placed in operation by the Galion Metallic Vault Co., Galion, Ohio, a leading man-

facturer in that field, and one of the same type was installed by another Ohio vault manufacturer. The special-type welder for burial vault work was designed and built by the Federal Machine & Welder Co., Warren, Ohio.

Marked changes in the manufacture of metal burial vaults, including the design and forming of the vault members, were made in the Galion plant with the introduction

of flash welding equipment. A new production line was provided, and the welding machine located in this line might be designated as the heart of the entire production system in the plant.

Manufacturing economies have been effected and production has been speeded up with the new welding equipment and the vault has been redesigned for the new welded models, making its lines more



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graceful and its appearance more attractive and increasing its strength.

A burial vault is welded in less than five minutes with the new self-contained welding machine, the operations consisting of welding two ends to the main member or dome to form the entire dome section. Daily production of this welded dome in the Galion Metallic Vault Co. plant is from 125 to 150 units in 16 hr. Before adopting the flash welding method the company arc welded its vaults, and the arc welding method is still being used for open-end models.

Finishing is an important step in the manufacture of the metal vaults, coatings being applied both for resistance to corrosion and for ornamental effect. The decalcomania process of finishings, for some time used for decorating instrument boards and some other automobile parts, recently was adopted by the Galion company for providing a marble finish on vaults and this indicates an important expansion of the use of decalcomania transfers for beautifying metal. Metallic bronze finishes over various priming coats also are used, being applied in various colors.

The Galion plant is arranged for the progressive movement of work for successive operations, thus minimizing handling and effecting economies in production. Virtually the only backtracking is in the

EXPANDING rapidly the past few years, the metal vault industry has become an important consumer of sheet steel. Metal burial vault manufacturers in this country now number 55. About 85 per cent of the vaults are made in Ohio and the city of Galion with five vault manufacturers seems to be the center of the industry.

finishing department, where vaults are routed back on gravity roller conveyors for consecutive coating, baking and drying operations.

Sheets and other raw material enter the plant from two side doors at the lower end. Rail shipments come in on one side and truck shipments on the opposite side. The sheets are stacked in the raw stock storage base at that end of the building.

Two methods of fabrication are followed by the company in making vaults. In the new model that is flash welded two ends are formed with a 6% in. draw, the drawn portion providing a flange of that depth, of the same size and contour as the dome section. The two ends and dome are welded together, the transverse joint around the dome being the same distance from the

ends as the depth of draw on the end members. The completed dome fits snugly over a pressed steel base which is embossed to a height of 3½ in. and is locked to the base after the casket has been lowered into the vault. The open-end model has a hinged door at the end.

All vaults are made of 12-gage sheet steel. Armco ingot iron is used in the manufacture of the more expensive model designated as the Cryptorium, and copper-bearing steel is used in making a cheaper type of vault. Pickled stock usually is used. The dome for a standard-size vault is made from a sheet 84½ in. x 86½ in. For the base a sheet 94 7/16 in. x 38 7/16 in. is used.

Dome Made in Hydraulic Press

For making the dome and dome ends a very large single ram-type hydraulic press with a ram pressure of 750 tons and a pressure of 250 tons on the pad was installed recently. This has a 24-in. stroke and 30 in. "daylight" between the bolster and the platen when the ram is in its top position. The press is equipped for hand control with a push button or lever, or for fully automatic control. The press was built by the Hydraulic Press Mfg. Co., Mount Gilead, Ohio.

The two sides of the dome are formed at the same time, giving the piece a U-shape, and during

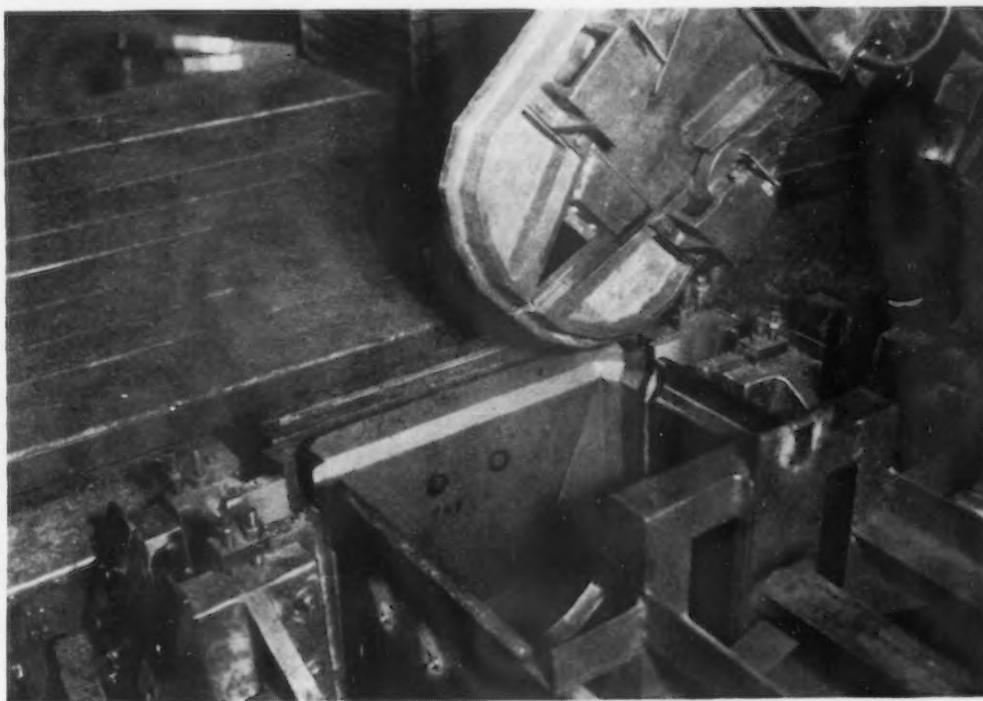
AT RIGHT

THE dome and head in their welding position in the machine. One of the inner expanding dies is about to be lowered into the machine.

• • •

AT LEFT

A BURIAL vault is shown being lowered into the flash welding machine, in which the two ends are welded to the large main section or dome. One of the sets of dies used in the welding operation is carried on two hinged arms and are in position for lowering into the vault. The second arm and die directly back of the unit in the foreground are barely distinguishable in the picture.





AFTER the dies are lowered into the vault they, with the outer contracting dies, hold the two parts of the vault in position for welding and provide the electrical contact. The welding cycle was under way when this picture was taken. • • •

this single operation flanges are formed on the longitudinal edges of the dome for reinforcing purposes and to provide a base to hold the locking mechanism. Then the top of the dome is formed to correct radius to assure the symmetrical appearance of the finished dome. The two ends or heads are drawn in one operation on the hydraulic press and are trimmed on a Quickwork metal forming and cutting machine.

Meehanite iron and welded steel dies are used for the most part, the pads and filler backs being of steel. Massive forming dies are required, some of these weighing up to 5 tons. The dies are handled with a 5-ton overhead crane.

After the dome is formed handle studs are welded to the sides, and the dome and the two ends go to the welding machine.

Welding Machine Is Massive

The massive size of the welding machine is indicated by its height, which is 15 ft., when the dies are open, and by its weight, which is 90,000 lb. For convenience in handling work the machine is set in a pit 5½ ft. deep and extends 3 ft. above the factory floor to the working platform level. The domes and ends are delivered to the machine with a pneumatic hoist attached to a jib crane. The dome is

handled in a fixture hooked to the hoist. This fixture is clamped inside the dome by two clamping dogs, and when the dome is lowered into the welding machine the fixture assists in locating it in the proper position.

The dome and head are held in position for welding by two outer contracting dies in the machine, one for each member, and by two inner expanding dies carried on hinged die arms which are lowered into place after the dome and head have been set in the machine. Then the die arms carrying the internal expanding dies are closed and locked in position, and pressure is applied during the downward motion of the die arms by four air cylinders. This pressure expands the inner expanding and outer contracting dies against the dome and head, and this pressure holds the two parts in position for welding and provides the electrical

contact for the flow of current into the parts that are to be joined. Two air cylinders then push the dome against the head, bringing the edges in contact.

Electrical contact thus being made, the current is turned on and the cycle of welding operations begins. Burning away the edges and



Vaults leaving the baking oven at the right and



VIEW in the painting department showing three of the spray booths and some of the roller conveyors. The depressed cross conveyor track allows a transverse movement of the vaults.

bringing the metal to welding temperature requires $16 \frac{2}{5}$ sec. The cycle is completed by upsetting or forcing the edges together, which requires $\frac{3}{5}$ sec. A pressure of 75 tons is applied for upsetting. The length of each welded seam on a vault of standard size is 84 in.

When the welding cycle is

finished the die arms are given an upward motion to release the dies, and this causes a release of the electrical contact on the vault. Then the die arms are unlocked and raised to a perpendicular position by two electrical hoists. Then the vault is lifted out, turned around and put back in the machine and the head is welded to the opposite end. Remote push button control is provided for controlling the electrical current. Air cylinders are controlled by three-way air valves.

Heating current is supplied by two 250-kva. transformers. Because of the severe surge placed on the incoming power line it was found necessary to use a motor generator set to supply electrical energy and to correct the power factor in the plant. This set, furnished by the Ideal Electric & Mfg. Co., Mansfield, Ohio, consists of a synchronous motor operating on 2300-volt,

60-cycle current, a d.c. exciter, switch panel and voltage regulator. The alternator is a single-phase 440-volt, 60-cycle unit with direct-connected exciter.

The Finishing Operations

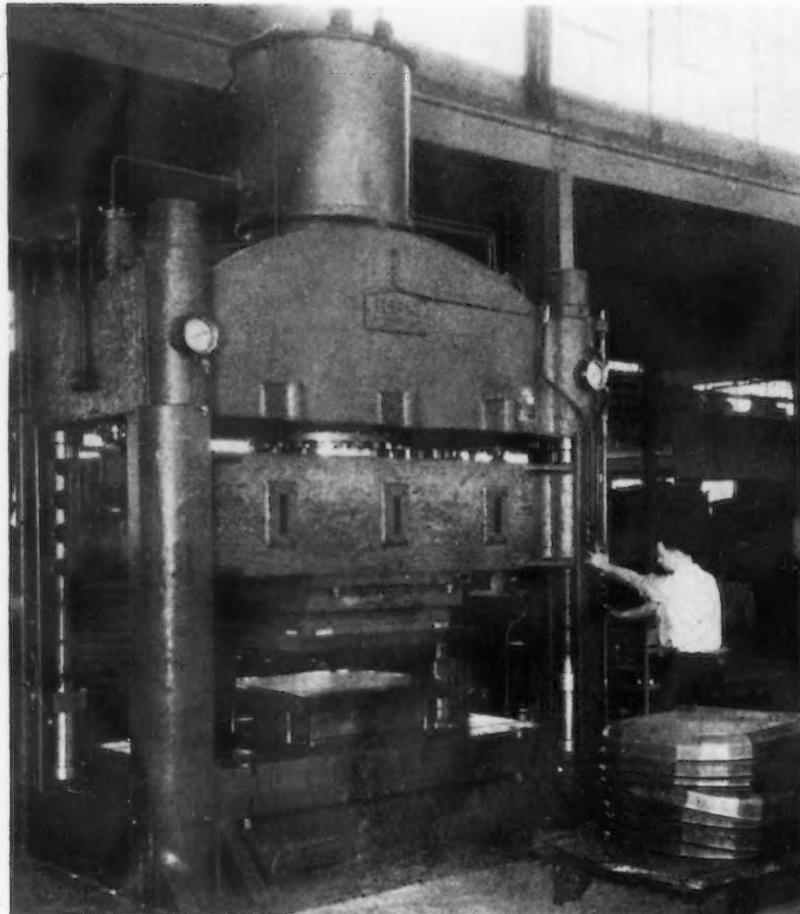
After welding, the vault is placed on a roller gravity conveyor with two working platforms between conveyor sections. On the first, the flash produced by upsetting is chipped off with a pneumatic chipping hammer. This chipped surface is smoothed by grinding at the next station. Then the vault is tested for leaks by being immersed in a tank of water.

The vault is then ready for its protective and decorating coats. On reaching the paint department it is placed on a metal pallet, on which it moves through this department and through the ovens for various operations. It is not taken off the pallet until it reaches the packing department where it is crated for shipment.

The vault is first cleaned and the surface inside and out is prepared for painting. A flat priming coat is sprayed on the interior. Then the vault goes to another spray booth, is turned over and a priming coat is sprayed on the outside. The priming coat serves as a corrosion resistant and also as a bonding for the subsequent lacquer coat.



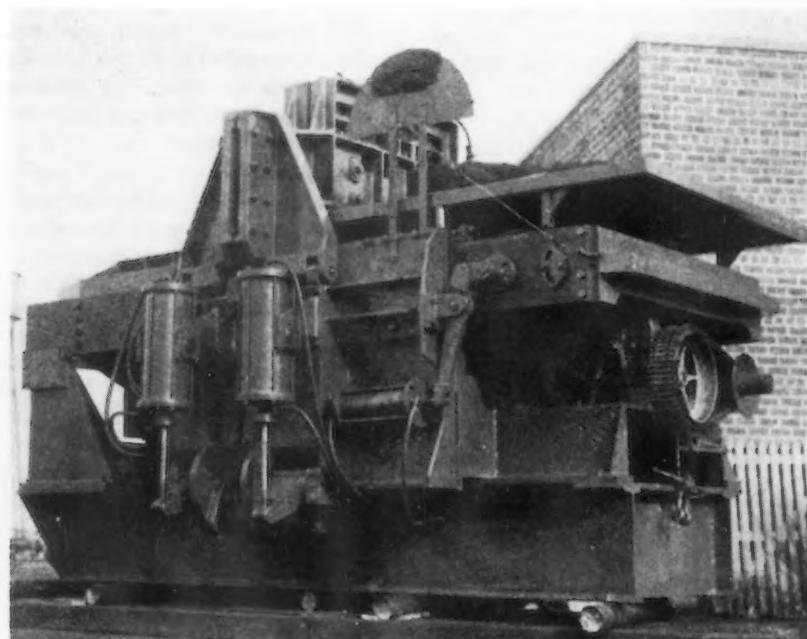
the low heat oven at the left on roller conveyors.



HYDRAULIC press of 750 tons capacity that is used to form the domes and end members. Some of the latter are shown on the truck.

During spraying, the vault rests on an air-controlled pedestal permitting it to be placed at a con-

venient working height. Vaults are made with three standard finishes in various colors. These



VIEW of the flash welding machine before its installation. This machine is located in a pit, the greater part of it below floor level.

are designated as cobweb, pine tree, and marble finishes.

How Embossed Effect Is Produced

Embossing, which produces the figured effect for the cobweb and pine tree finishes, is effected by baking the priming coat at a temperature of 350 deg. F. This coat is baked 70 min. at that temperature in a continuous oil-fired oven, 114 ft. long. The pallet holding the vault is pushed into the oven on the roller conveyor and is picked up by a power-driven conveyor, which carries it through the oven. After baking, the vault goes to a third spray booth in which lacquer bronze is applied in any of half a dozen colors. Then the outer coat is dried 45 min. in a low-heat oven at a temperature of 145 deg.

The marble finish is supplied in two designs which are reproductions of Grecian and Italian marbles. After the primer coat is baked a thin sheet of a cellulose product with a design to represent marble and having an adhesive coat on one side to make it stick to the metal is applied over the surface of the vault. Then this coating is dried in a small oven, after which a coating of clear lacquer is applied over the marble-like finish. Then the vault goes through the drying oven and on to the packing department.

Making Open-End Type Vaults

The same production equipment except for welding is used in manufacturing the open-end type of vaults, and the same methods are followed in the painting department where similar coatings are applied. Joints in the open-end type are made by arc welding. In the construction of this type there is a longitudinal seam extending the length of the vault dome on either side which is made with a Lincoln automatic seam welder at a speed of 24 to 30 in. per min. Ends of this type are fabricated with a standard hand-type arc welder. A gasket on the face of an angle iron reinforcement welded on the ends of the dome on the inside provides a method of making the vault air tight when the door is closed. The gasket of composition material is vulcanized at 350 deg. to the metal back of it. This vault is tested for leaks by being submerged in a tank of water, where an air pressure of 2 lb. is forced into the interior.

OLD AGE PENSIONS

II—Cost Experience and Estimates

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IN this, the second and concluding article on old age pensions, we deal with cost experience and cost estimates. Actual cost experience is available in connection with State and county plans, all non-contributory, which have been in operation for a number of years. The results, as compared with the cost of old age relief through almshouse methods, distinctly favor the pension plan.

When it comes to the pension plan advocated by Senator Wagner, as part of his Social Security Bill, cost experience is lacking and we have to depend upon estimates. These indicate that a horizontal payroll tax, as proposed, is impractical and would bankrupt some groups of industries where the proportion of wage cost to profits is large.

Material in these studies is drawn from a comprehensive study of old age pensions made by a committee of the National Conference of Business Paper Editors. Copies of the full report may be secured at a cost of 10 cents each from the Associated Business Papers, 330 West Forty-Second Street, New York.



IN any consideration of pension plans, the question of costs assumes a significance of determining importance. It is only during recent years, after the adoption of pension laws by a number of states, that fairly adequate information on cost of pensions has become available.

Particularly for California and New York, states which have had pension plans in operation since 1929 and 1930, respectively, considerable information is available

which may be useful in estimating what such plans may cost elsewhere.

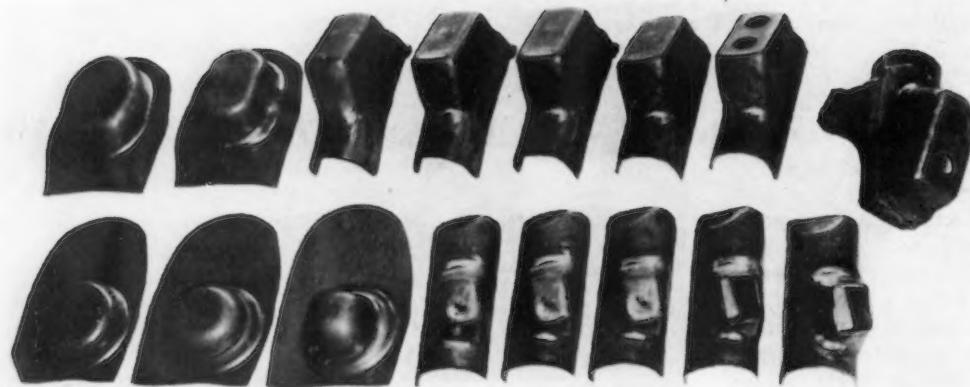
During the first three years of its operation the California plan pensioned 15,813 persons. Deaths and other causes reduced the number to 12,520 at the end of 1932. The average pension paid at the latter date was \$22.08 per month and payments for the three years totaled \$3,057,000. Of every 100 persons in the state 16 years of age or older, 3.4 were getting a pension. The proportion of de-

pended aged in rural sections was substantially higher than in urban centers; pensioners represented 1 per cent to 3 per cent of the aged in Los Angeles and San Francisco, but from 8 per cent to 15 per cent in 11 rural counties.

The experience of New York has been much the same. During the first two years of operation of its law 64,636 pensions were granted. At the end of 1932, 54,185 were left, their total cost during the year was \$15,454,000, or \$23.80 per month per pensioner. The per capita cost to every person in the state for this relief was \$1.23 for the year. Taxpayers paid 26.5 cents per \$1,000 of assessed taxable real property for this purpose. At the end of 1932 8.1 per cent of all persons 65 years old or more were getting a pension, or 4.3 per thousand of all inhabitants. The average monthly grant in New York City in 1932 was \$28.60, and \$19.59 for the rest of the state. Total monthly cost of pension payments reached a high average of \$1,300,000 in March, 1932, but had dropped to \$1,052,000 in December, 1933.

In Table 1 are assembled cost
(CONTINUED ON PAGE 76)

Knee-Action Manufacture Refined



FRONT and rear halves of the housing go through 15 operations prior to welding. Here are the halves of the left-hand unit showing the successive operations; a similar series in reversed form is required for the right-hand unit. The bottom row shows the rear half as it develops—1, blank and draw; 2, reduce; 3, second reduce; 4, first form; 5, finish form; 6, size; 7, pierce; 8, trim. The front half (top row) operations are the same except that it is reduced but once. The welded housing shows the pair of shock absorber holes and a main bearing hole in the front half. The rectangular opening in the rear half is for welding to the steering knuckle forging.



THE adoption of numerous machines of entirely new design, built especially for operations peculiar to the manufacture and assembly of inclosed type individual front wheel suspension (knee-action) units, and a thoroughgoing revision of the plant layout to procure the orderly progress of component parts from raw material to finished units, have been combined to facilitate production and to improve the product at the Chevrolet gear and axle plant, Detroit.

Chevrolet's 1935 knee-action units are virtually unchanged from the 1934 models. Slight modifications in the size of the bearings and of wheel supporting members have been made, but a year's use disclosed no need for any departure

CHEVROLET has improved its knee-action units and facilitated their production by installation of machines of new design and by a rearrangement of manufacturing processes, which included the bringing under one roof of all operations excepting forging and the making of coil springs. A comprehensive system of conveyors, totaling 10,865 ft., insures efficient handling of parts. A complete system of gaging in progressive steps stops defective work so that no operations are performed on parts which later will have to be rejected.

from the principles and construction of the original design. Nevertheless, Chevrolet manufacturing authorities rate the current units as greatly improved over last year's because of refinements in machining, inspecting, and testing.

As a single example of improved results in manufacture, it is stated that the compressed-air test to detect leaks in completed housings now shows but one in every 20 requiring correction.

The use of machines especially designed for the job has bettered the product at almost every stage of its manufacture, while a complete system of gaging in progressive steps stops defective work at whatever stage of completion it has reached, so that no operations are performed on parts that will have to be rejected later.

By Use of New Equipment

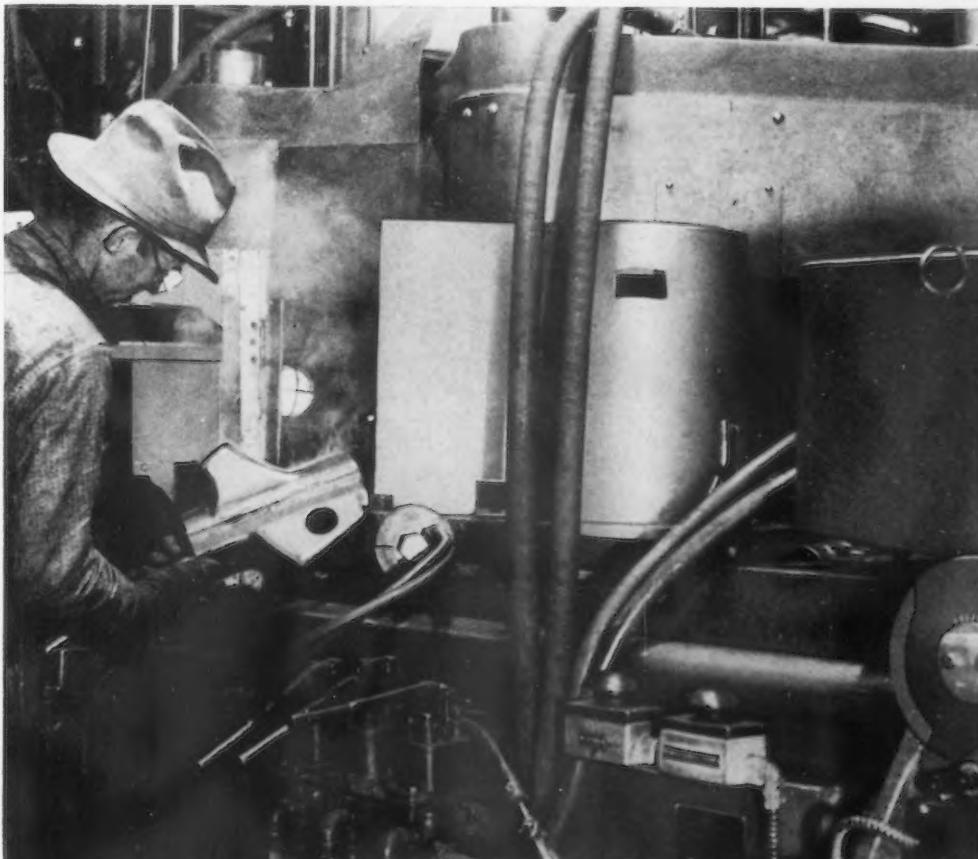
By JOHN M. BONBRIGHT

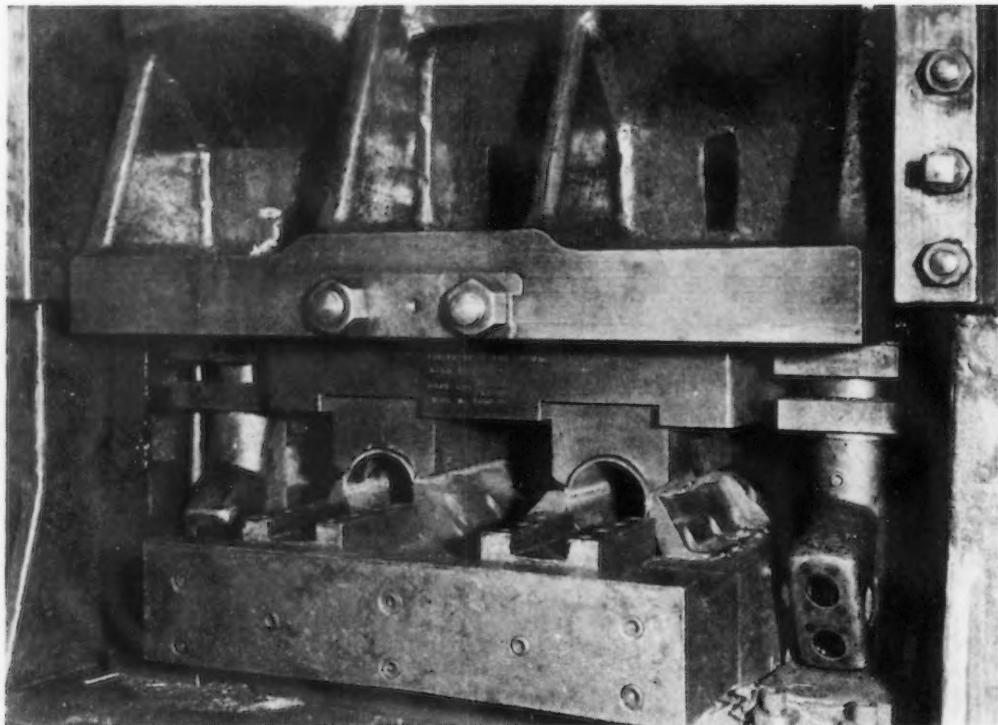
Of equal importance to the refining of the product, from the point of view of the manufacturer who looks for efficiency and economy in production, is the effect of the newly completed revision of the plant layout, which has brought all manufacturing operations (except forging and coil spring man-

facture) under one roof. The plant management has rearranged all machines in correct sequence of operations, and provided for the orderly progress of each component part to arrive at the right time and in the right quantity at the point where it is to be assembled with other parts. Thus, the stamping,

drawing, and forming operations required prior to welding the front and rear halves of the knee-action housing, and the upper and lower halves of the king-pin support (the cross-member that supplants the front axle), and the welding operations as well, all of which formerly were handled in a distant

HALVES of the housing are joined in a specially designed welding machine of which eight have been built for Chevrolet. The halves are laid in horizontal dies, open end toward the front. In operation, the right-hand fixtures are advanced by cam action, regulated to bring the edges of the halves in contact and to control the size of the welded piece. Timing of the machine is automatic.





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AFTER each stroke of this machine, the operator removes the trimmed housings from the two vertical fixtures, transfers the two from the horizontal dies to the vertical fixtures, and places two more in the horizontal position. At each stroke the machine shears the welding flash from the exterior of the two housings and broaches the interior of the pair previously trimmed outside.
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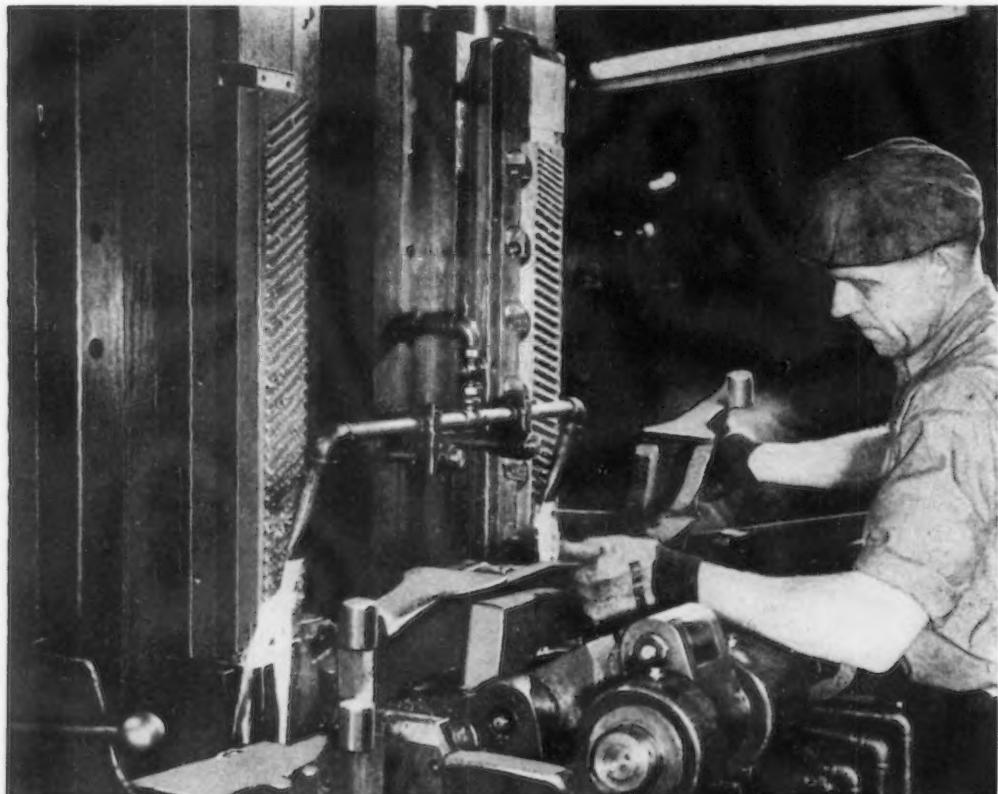
building, are now consolidated in a single building in which all subsequent manufacturing and assembling operations are performed. Not only is long-haul inter-plant trucking eliminated, but also the use of industrial trucks between

different sections within the knee-action building itself.

An unusually comprehensive system of conveyors, totaling 10,865 ft., has been installed to bring about the most efficient handling of parts. These power-driven con-

veyors are supplemented with gravity chutes between machines that comprise a series of equally timed steps of manufacture.

Thus, for each of the five presses by which blanks for housings or king-pin supports are formed, there



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PADS near the ends of the king-pin support are surface broached in this special machine to provide full contact and accurate alignment when the support is bolted to the chassis frame. Here the operator is placing the support in the machine, the pads (on top) not yet in position for machining. The two broaches with diagonal cutting edges are 3½ in. wide and have a 35-in. stroke. Each broach has an individual hydraulic drive, each capable of 10-ton effort.
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is a separate battery of drawing and forming presses, keeping pace with one another, served by gravity chutes into which the work is ejected from each machine, to slide to the next machine. At the ends of the parallel batteries, the work is placed on conveyors that carry it to that section of the plant in which the next series of operations is to be performed.

Probably the greatest improvement in the conveyor system as a whole is the adoption of two separate lines in parallel, one devoted exclusively to right side, the other to left side, parts and assemblies—the two knee-action units for each car, of course, being formed in reverse image of each other, and requiring many parts so reversed in shape and in the location of attachments, machined faces, perforations, etc. The system of dual conveyors extends from the beginning of the series of operations all the way to the final assembly line. By this method, the operators of machines equipped with dies or jigs for work on only one particular half of the housing now receive a constant supply of parts, and no longer are required to select them from among parts they cannot handle.

New Dies for King-Pin Support

While the knee units themselves are only slightly changed this year, the king-pin support for 1935 is entirely new in design. It is heavier and more rigid, being of deeper section and including additional welded reinforcements. All dies in use this year are new, and many additional machining operations are performed to procure accurate shaping of the support and to provide for its being assembled in the chassis more securely and more accurately positioned. For example, all holes (formerly punched) are now drilled in jigs on multiple drills, while the surfaces where the support contacts with the chassis frame are now faced and located in the same plane by specially developed external broaching machines. Correct alignment of the support in the chassis, upon which depends front wheel alignment, is assured by these improvements.

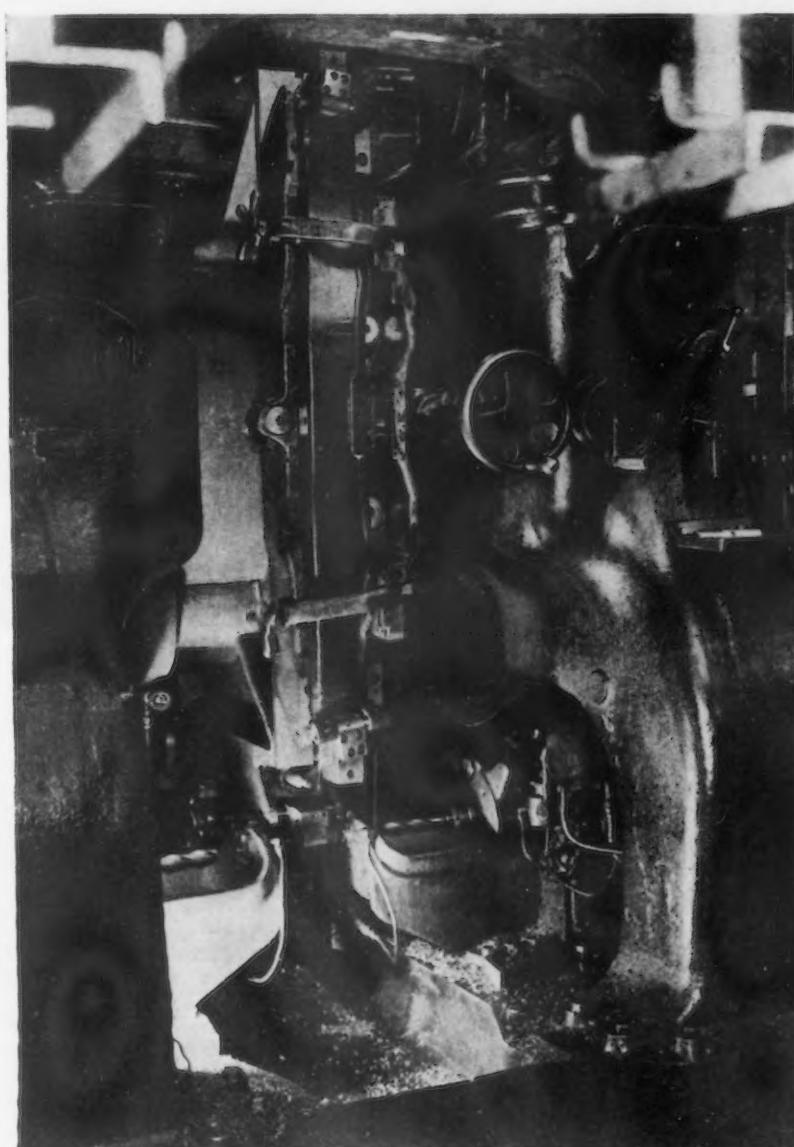
The routing sheets for work on both the housing and king-pin supports show many additional or altered operations as compared with the 1934 job, utilizing new machines, many of them specially

created for their purpose, and new gages, inspections and testing fixtures.

Knee-Action Housings

Housings are formed from 5/32-in. sheet steel. Four sets of dies are required—a set for each half

shall be accurate alinement and close contact between the halves in the welders. The liberal use of coining presses at this and subsequent steps of manufacture is credited with much of the improvement over last year's work. Coining presses are used wherever pos-

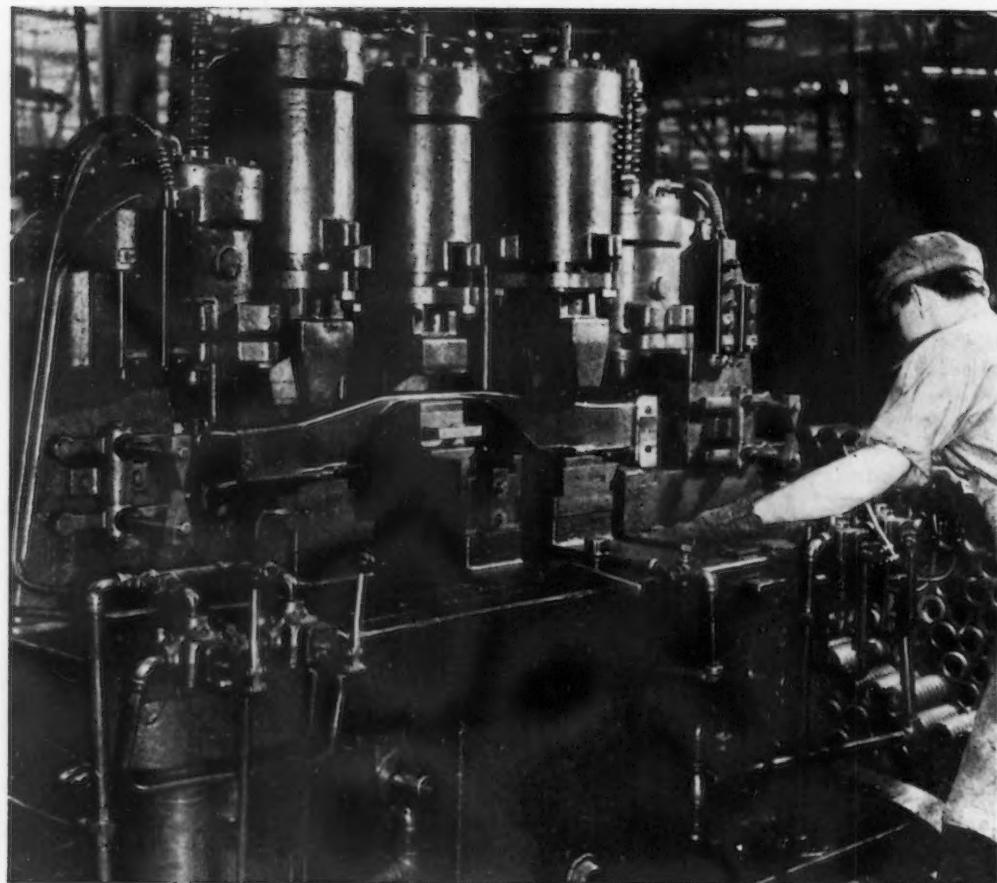


KING-PIN supports, 53 in. long, are clamped vertically on the faces of the square holder which rotates between the massive mountings of this machine in which king-pin holes are drilled in the yokes. While the operator is removing a finished piece and inserting another, the yokes in the top position are drilled and those at the bottom are bored to their final size.

(front and rear) for the left side unit, and a set in reverse shape for the right side unit. The preliminary operations are blank and draw, reduce, first form, finish form and trim. The pieces are then sized in a 300-ton coining press, which squares up and straightens the edges so that there

sible to insure exact shape and size in the parts, for accuracy either in welding or in the alinement of bushings, brackets, shock absorbers, etc., to be attached.

The first welding operation is to affix the small inside shock absorber reinforcement in the front half of the housing, after which



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HYDRAULIC power is used to clamp the king-pin support immovably and to bend or twist it if previous gauging has shown it to be out of alignment. Colored electric lights and wedge-shaped sights tell the operator in which direction to apply power to effect the required correction. Quick-acting levers permit exact control of the machine.

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the face on which the two shock absorbers are to be seated is trued up in a coining press, then smoothed by grinding.

Specially designed Taylor-Winfield welders are used to join the two halves of the housing. Eight of these machines have been installed. The welder, powered by a 5-hp. motor, is equipped with a Reeves variable-speed control. The operator (one to each machine) inserts the two halves in horizontal position, the open ends toward the front of the machine, then closes the flash guards (the machine will not operate if they are left open), and pushes the starter button. The sequence and timing of operations are entirely automatic. The movable head is advanced by adjustable cam action, which first brings the edges of the parts in full contact and then regulates the pressure on the edges during the welding, to assure correct finished size. The arc is formed entirely around the two sections—a length of 26½ in.—by a current of 440 volts, supplying 900 amp. flash and increasing to 2000 amp. The machine forms a weld remarkably uniform in density, with a minimum of flash

material requiring removal. The flash is trimmed off in a vertical press which shears the excess metal from the exterior of a pair of housings in horizontal dies, at the same time broaching the welded seam inside two other housings.

A new method of removing fused particles or sparks from inside the housings makes use of circular wire brushes, slightly larger in diameter than the cylinders, running at high speed on horizontal arbors. Two coining operations follow, one to flatten the circular bottom of the cylinder to insure proper seating of the radius arm attachment, and another to insure roundness of the open end for boring and threading.

Steering knuckles are welded to the extruded projections on the housing in a battery of electric welders installed last year but now equipped with new fixtures and improved in operation. The housing is then subjected to its first under-water test, which utilizes air under 15-lb. pressure to reveal any leaks.

A newly added test follows, the housing being inverted over an up-

right with the steering knuckle against a block of live rubber, then rapidly vibrated by blows from a 40-lb. pneumatic hammer. This test not only reveals faulty welding, but aids greatly in cleaning by shaking free any remaining spatterings from the welder.

Conveyor Line Rearranged

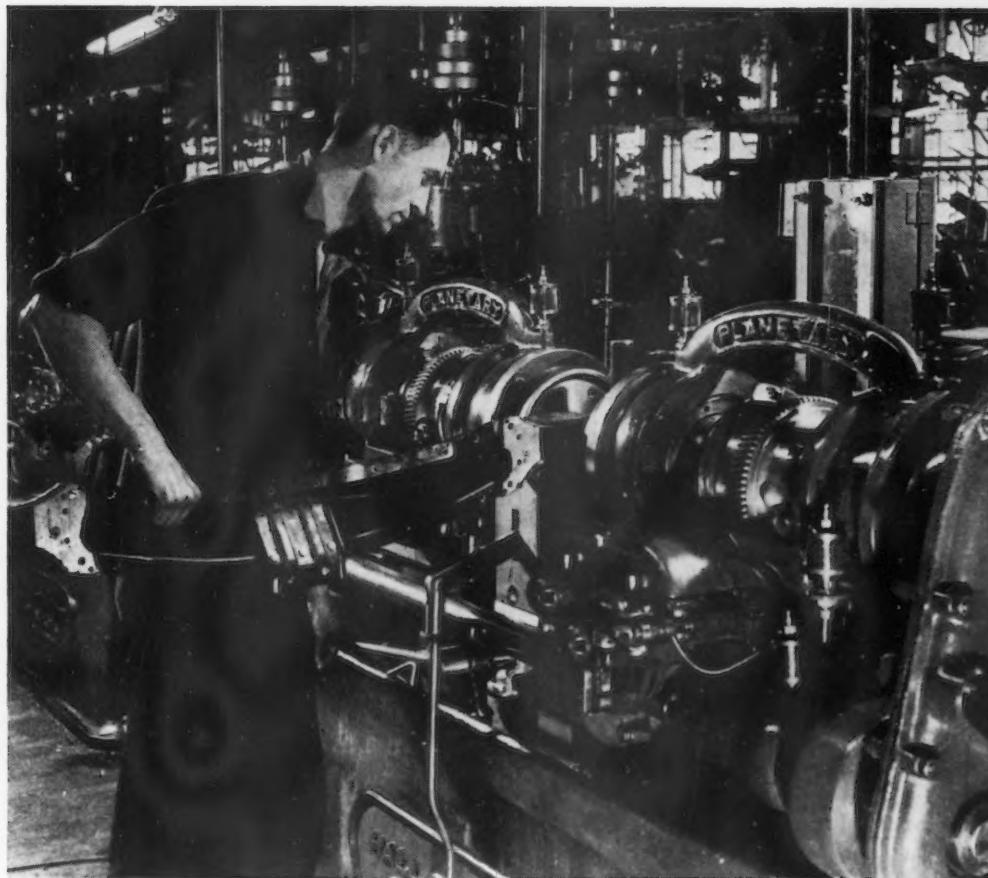
Rearrangement of the conveyor line has brought improved results in the welding of main shaft bearing bosses to the housings. An arbor carrying two bosses is inserted through the housing, and the entire assembly then rotates in the electric welder which makes a 360 deg. weld around each bushing. The conveyor line that brings the work to the welders now extends some distance beyond the machines and doubles back to return to them. The arbor is allowed to remain in the housings loaded on the conveyor, and serves to hold the bushings in alignment while the parts are air-cooled. As they repass the welders, the arbors are withdrawn from the housings.

After another inspection, the housings pass through a normalizing oven (two hours at 900 deg.).

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FIVE double-end planetary milling machines cut slots around the inside circumference of the king-pin hole to receive expanding lock ring retainers for the king-pin bearing plugs, which must withstand the high pressures of modern lubricating systems.

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Bearings are then realined, if necessary. Another water test follows, this time testing the additional welds around the bushings.

Both bushings are next diamond-bored in a new machine that handles a right and a left hand unit at the same time. Next, the top reinforcing ring is reamed and chamfered, and the exterior thread space is turned.

Four new type rotary washing machines, utilizing high-pressure jets of hot water impelled by live steam, are used to remove particles loosened by the wire brushes. The cleaning is completed by blowing out the housings with a jet of air under 90-lb. pressure. The housings are dried, then their inside surfaces are sprayed with a lacquer to fix any particles that might become detached in service.

The improved fixtures by which the housings are positively aligned during the broaching of the king-pin holes in the steering knuckles have resulted in much closer finish, and consequent improvement in front-wheel alignment. Under the new method the holes can be held to an accuracy of 0.005 in.

Finally, the top of the housing

is threaded to receive the cap. This operation formerly was done early in the manufacturing sequence, requiring the use of a screwed-on protecting ring to safeguard the $\frac{3}{8}$ -in. threaded band through all subsequent operations. Threading is now the last machining operation, and the use of the ring is obviated.

The housing, now complete, undergoes a thorough inspection of every surface, inside and out, being stood up over an aperture in the bench through which is projected a beam of light, which permits the interior to be viewed clearly through the openings for the shock absorbers. After again being washed and blown out with compressed air, the housings undergo a final water test. Those that are passed and those that have been corrected by hand-welding, are then hung on the conveyor line to be carried to the knee-action assembly section.

King-Pin Supports

On the Chevrolet knee-action models the front cross-member of the chassis is a pressed steel member, oddly shaped, with curves in

the vertical and horizontal plane, having a deep channel section and heavy flanges to provide rigidity. Parts of the support are converted into box sections or are reinforced by the addition of other stampings welded in place. The finished support is 44 $\frac{1}{2}$ in. long (without the king-pin yokes) and weighs 27 lb. The 1935 design is entirely different from last year's, and all dies are new. Manufacturing features credited with having brought about marked improvement in the finished product include planned arrangement of the dies for inspection after each operation, and complete gaging in successive steps.

The blank for the main channel section, or lower half, is cut from 5/32-in. steel plates. Three forming operations follow, then trimming in a press which also punches the pilot hole that serves to locate the work in all subsequent operations.

After the welding of reinforcements and of the upper and lower halves of the support, followed by trimming, both ends are sized in a coining press, to shape the rectangular open ends accurately

(CONTINUED ON PAGE 82)



Improvements in Production

All-Steel Shears Utilize a Light-Beam Shearing Line

THE Cincinnati Shaper Co., Cincinnati, has recently added to its line of all-steel shears a smaller series, with a capacity for 10 gage mild steel in 8, 10, and 12 ft. lengths. Illustrations below, show the 10-ft. machine.

General provisions follow previous designs as employed by this company. The main frame, table and crosshead are cut from heavy rolled steel plate; hydraulic hold-downs have plungers spaced at 12-in. centers, and develop a pres-

sure of approximately 2000 lb. each; the five-jaw clutch is totally inclosed and runs under oil. In addition there is a friction slip or clutch for the flywheel rim as overload protection. The characteristic features of this shear are the low rake of the knives, 5/16 in. to the ft.; four-edge solid knives and a speed of 60 strokes per minute.

Standard equipment includes knife guard, automatic lubricating system, side gage, front gage with extension arms, and ball bear-

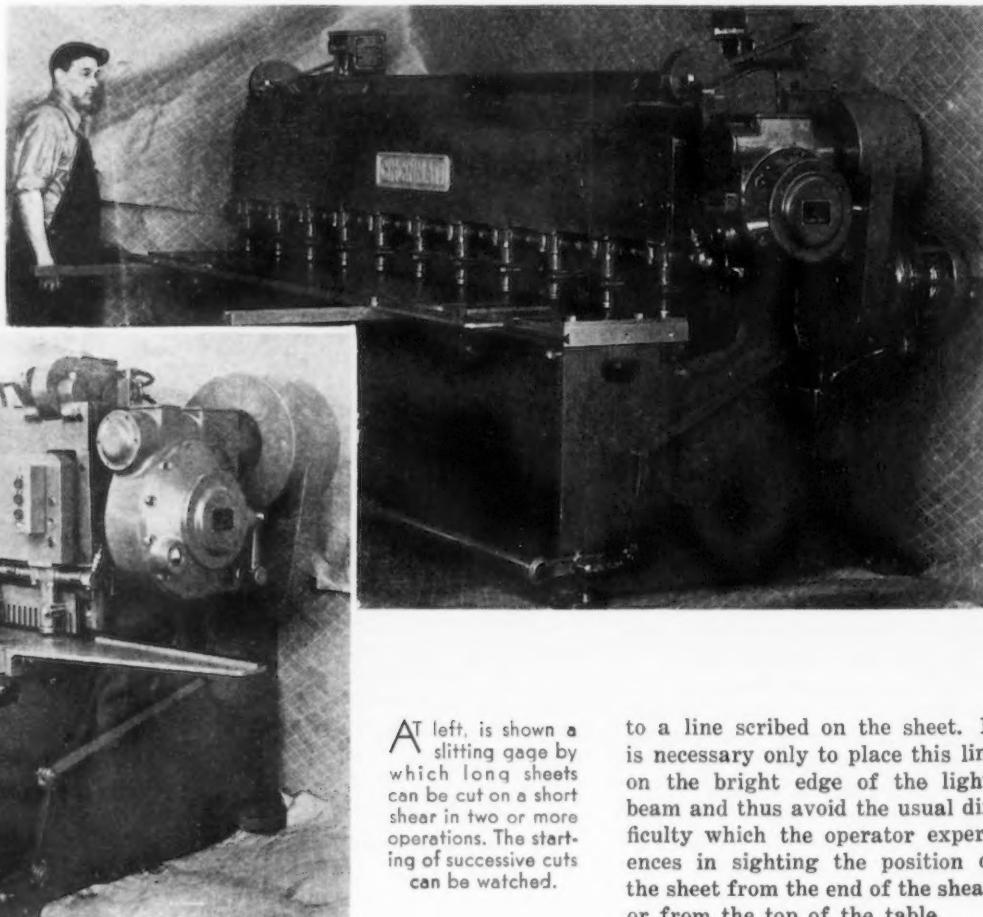
ing universal back gage, adjustable from one point with a dial reading to inches and sixty-fourths.

The shear is regularly furnished with a 6 in. throat in the housings. The insert below, shows a slitting gage by which long sheets can be cut on a short shear in two or more operations. With this equipment it is possible to see where the successive cuts start.

The motor has three-button control, the third being an inching button for operating the shear when setting the knives.

Electric lights not only illuminate the table of the machine, but are so placed and focused that they afford a means for shearing

BY extending a beam of light along a scribed line the difficulties of "sighting" are avoided in the positioning of material to be sheared.



At left, is shown a slitting gage by which long sheets can be cut on a short shear in two or more operations. The starting of successive cuts can be watched.

and Shop Equipment . . .



Weld Flash Trimmer Has 120-In. Stroke

A LARGE draw-cut trimming machine for trimming the flash from butt welded sheets having a seam up to 120 in. in length has been added to the line of the Morton Mfg. Co., Muskegon Heights, Mich. It is designed to handle stock as thin as No. 20 gage. See below.

In design the machine follows the company's patented feature of vertical moving ram-carrying member which raises the upper ram and clamping dies two inches vertically for ease in entering and removing the work. The upper ram is raised and lowered by roller bearing eccentrics. Hardened steel-lined dies are secured to the ram housing member and the rams and cutting tools travel in the path parallel with the hardened die surfaces. The upper ram is provided with automatic compensation to take care of variation in metal thickness. This permits the trimming of a No. 20 or 16 gage metal without any change in the tool setup.

Power is applied to the two reciprocating rams by means of direct connected reversing type motor. A built-in worm gear re-

duction applies the power by means of vertical pinion directly to rack teeth cut in the sides of the ram. Cutting and return speed is approximately 60 ft. per min.

Cutting tools are securely fixed in the ram by patented adjustable tool holders. The tools are of bit-type.

During the semi-automatic operation of the machine the work unclamps and as soon as the cutting rams reach the inward position the work can be removed while the rams are returning to their initial position. To insure the dies being free from dirt, a special electrical timing device operates a solenoid valve blowing a blast of air across the dies. This operation is not

performed until after the rams have reached the outer position. The blast of air is accurately timed and has adjustment from five to ten seconds.

It is necessary to center the sheet very accurately with the die and for this purpose a special solenoid operated centering and lighting device is used within the upper ram.

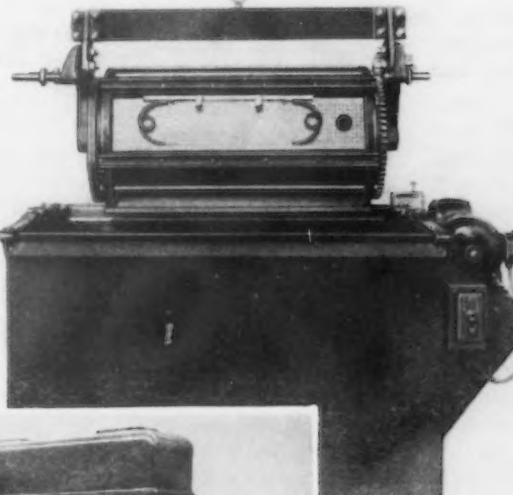
Plating Barrel Design Avoids Tree Formation

A NEW model plating barrel utilizing shock-resisting formed-rubber throughout as the insulating material, has been put

BELOW

A SOLENOID valve operation is for air-pressure cleaning of dies after the machine rams have reached the outward stroke position. The air blast is adjustable as to duration.

(See Column 1)



ABOVE

AGGREGATIONS of tree-like formations during plating process are said to be eliminated by design provisions and materials used in the construction of this plating barrel.

on the market by the Udylite Co., Detroit. See page 31.

Strength is attained through the use of steel in the framework. The cylinder is of steel and into it are fitted rubber rails, steel reinforced, and rubber heads reinforced by steel end plates. The rubber used does not disintegrate by absorbing plating solution and its resistance to shocks and stresses is said to be many times greater than that of molded rubber.

Assembly strength is gained by the use of $\frac{3}{4}$ -in. staybolts, bolted through rubber and steel plates.

The steel framework is exposed and each part is anodically charged. Cathode lead is encased in continuous, unbroken insulation from contact pins to dangler arbor; no slip joints are employed. The cast iron hanger from which the cylinder is suspended is not integral with nor a part of the cathode lead. The bearings on which the cylinder revolves are anodic and separate from the cathode lead. These design precautions are said to prevent treeling and to assure that all current goes directly to the work.

The cathode lead is red copper encased in three layers of rubber; its insulation is unbroken from bus-bar to danglers. Anodically charged hanger houses cathode lead and protects it mechanically.

Contact arbor shank is heavily chromium plated to facilitate cleaning. Three danglers on arbor assure ample current. A welded steel tank holds the heating and cooling coils. A large channel iron bridge member rigidly maintains cylinder alignment. Pins fastened to yoke connect cathode bus-bar with cathode lead and support cylinder firmly in saddles at four points—two on each side of the tank. The door lock operates as a unit. The motor is $\frac{1}{2}$ hp. Thermocounted push button switch protects the motor against overloading or single phasing.

The American Steel Warehouse Association, Inc., will hold its 26th annual convention at the Edgewater Beach Hotel, Chicago, May 14-16. The following new vice-presidents have been elected and will serve under the executive committee: J. J. Hill, Jr., Hill, Chase & Co., Philadelphia; Ray D. Love, Betz-Pierce Co., Cleveland; A. C. Castle, A. M. Castle & Co., San Francisco, and Richmond Lewis, Charles C. Lewis Co., Boston.

Portable Welding Gun and Equipment

THE Thomson-Gibb Electric Welding Co., Lynn, Mass., has developed a mobile welding machine consisting of a welding gun, operated by a single push-button switch, and a compact portable steel cabinet containing all the transforming, regulating, contacting and timing apparatus. The equipment is pictured below, and is particularly adapted to assembly line production or to work which is fabricated in jigs.

The machine is equipped with a demountable truck and a heavy lifting bolt and can be wheeled to the work or suspended on a traveling hoist. The power transformer, stepdown control transformer, heat regulator, contactor, weld timer, air regulator and gage are all housed in the cabinet. No outside connections for special low voltage control circuits, contactors or timers are needed. All controls are conveniently located within the cabinet.

The over-size transformer which supplies a large volume of current for short intervals and a weld timer which breaks the circuit the instant the weld is completed eliminate the need for special water or forced air-cooled leads. Welds are made in $1/20$ to $1/3$ of a second,

which is too fast to heat the leads or electrodes.

The standard gun can be fitted with a wide variety of interchangeable water-cooled yokes made of special heavy wall copper tube fitted with hard copper alloy welding tips.

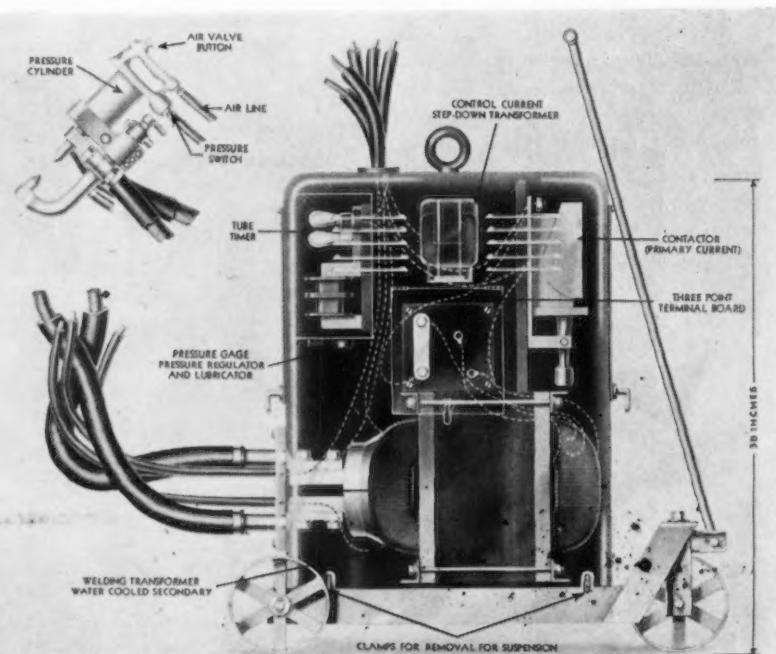
A built-in, pressure-operated limit switch automatically applies the current when the pressure in the air cylinder reaches a predetermined amount.

The unit illustrated can weld clean metal up to No. 16 gage and the gun can be fitted with yokes having throat depths up to 12 in.

New Still Reclaims Cleaning Solvents

ILLUSTRATION on page 33 shows a new solvent recovery still recently developed by the Barnstead Still & Sterilizer Co., Forest Hills, Boston. This type of still permits original-purity recovery from small or moderate quantities of cleaning solvents and reuse is said to be satisfactorily attained in all types of industrial plants using industrial solvents. Some of the more common of these are carbon tetrachloride, trichlorethylene, ethyl acetate, ether, alcohol, pentachlorethylene, acetone, toluol, benzol, naphtha, etc.

The stills are available for either



THIS welding unit, designed for assembly line production or for work fabricated in jigs, can weld clean metal up to No. 16 gage. The gun can be fitted with yokes having throats up to 12 in. (See column 2)

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continuous or batch operation, in a full range of capacities. They may be heated by steam, gas or electricity as desired. Because practically every problem in solvent recovery is different, these stills are more or less made to order of the materials best suited to the particular requirements of the plant.

Coolant Pump Design Eliminates Piping

A PIPE-FREE coolant pump which installs without distributing connections is pictured below. It is a product of the Ruthman Machinery Co., Cincinnati, and is designed particularly for machine tool installations.

The intake supply of coolant flows into the pump by gravity through a 4 in. x 6 in. opening in a mounting pad at the side of the machine. The discharge is directly into the base of the machine and utilizes a delivery pipe independently connected to the wall of the reservoir, in line with the 2½ in. round discharge opening in the pump mounting pad; attachment can be made by threading, caulking or expanding. This assembly design permits of attaching the pump independently by five cap screws and of confining the piping to the inside of the machine. Twin-

Coolant Pump Design Eliminates Piping and a self-cleaning feature gives added protection to design provision against harmful effect from gritty coolant.

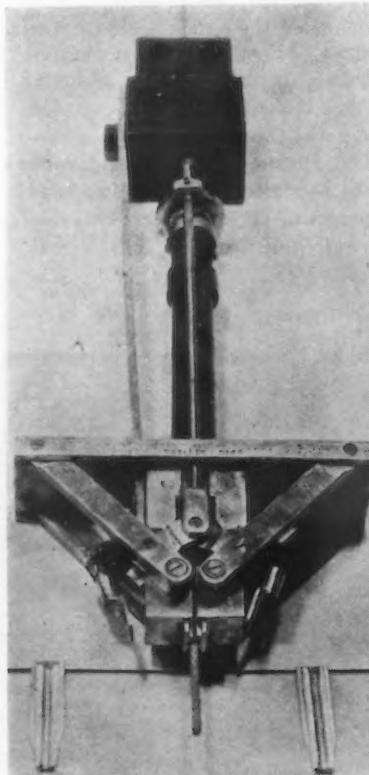


suction intake is provided and there are two separate compartments which communicate independently with the lower and upper sections of the impeller. In operation the double pumping action creates a hydrostatically balanced thrust which counteracts the weight of the vertical shaft. No packing nuts, foot or relief valves are employed. Within the pump there is no metal-to-metal contact, and thus coolant loaded with abrasive matter is not harmful to the pump. The one-piece pump shaft revolves on ball bearings sealed within the motor.

Self cleaning is accomplished through throttled flow; the internal agitation created exerts an outward pressure through the twin intakes to clean the main intake chamber. Capacity is 150 gal. per min. using 1 hp. 1725 r.p.m. motor.

Coated Electrodes and Contactor Device

WOVEN welding wire and an electrode contactor device for automatic metallic arc welding with heavily-coated electrodes are being manufactured by the Weld-



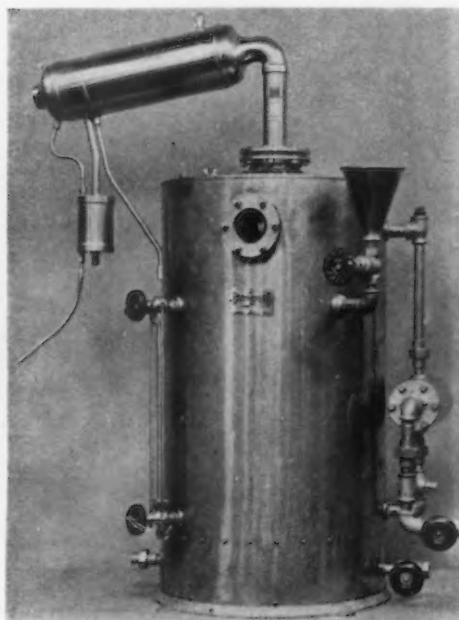
THIS electrode contactor unit consists of a toggling device designed to allow free passage of foreign matter and to separate the mechanical control from the contactor.

ing Wire Co., New Britain, Conn. See column 2 below. The welding wire consists of a solid core having multiple strands of wire woven thereon in the nature of a mesh, the pockets of which are filled with flux. The woven wire on mesh serves as a path for current from the auxiliary electrode contactor to the core, and is said to allow passage of high currents through the core from the contact point to arc zone because of the drop in potential created by the resistance at the crossings of the mesh. Uniform thickness of the coating throughout the length and diameter of the welding wire is also attributed to the braided construction. The diameter of the woven wire governs the total flux thickness; with an 0.023 in. diameter wire, for example, the total flux thickness is 0.046 in. The woven welding wire forms the negative electrode.

The electrode contactor designed for use with the woven welding wire consists of a toggling device said to allow free passage for foreign matter and to separate the mechanical control from the contactor. No part of the control conducts current and, in not being subject to heat, its mechanical members have long life. Tangential-grip feed rolls provide positive feed and gripping action. Pressure

New Still Reclaims Cleaning Solvents. Profitable recovery from moderate quantities of solvent solutions is said to be accomplished through the use of this equipment.

(See page 32, column 3)



required for feeding the electrode is said to have been lessened to an extent that prevents distortion of the electrode in feeding. The feed arrangement includes a single-adjustment plunger roll-type straightener, the function of which is to eliminate frictional wear on the contactor inserts. These inserts are made of cadmium copper.

The apparatus also includes a take-off reel consisting of a tapered steel barrel with demountable rim.

A sliding ground contactor makes use of the electrode coil as a high resistance to balance the variable resistance of the arc. This, it is stated, eliminates arc stray and permits taking current directly from the reel should foreign matter enter the contact tips.

The electrode contactor device is said to be adaptable to all standard automatic metallic arc welding units. The woven welding wire is furnished in coils having ta-

pered bore to facilitate mounting on the reels. It is also furnished in cut lengths for manual operation. Five sizes, from $\frac{1}{8}$ to $\frac{5}{16}$ in. in diameter, are stocked. Welds made with the equipment are said to have tensile strength of 75,000 to 80,000 lb. per sq. in. and to show an elongation of 28.4 per cent in 1 in. Both the woven welding wire and the electrode contactor are covered by patents and patents applied for.

Coiled Brass Annealed in Return Recuperative-Type Electric Furnace

OILED brass strip is annealed in a double-chamber, return recuperative type, electric furnace in the Cleveland plant of the Chase Brass & Copper Co. The installation of this furnace followed that of a continuous controlled-atmosphere electric furnace for bright annealing copper tubing described in THE IRON AGE, Dec. 21, 1933.

The furnace consists of two units inclosed in a single shell. Its overall length is 40 ft. and its overall width is 19 ft. The connected load is 240 kw.—120 kw. in each unit. Each furnace unit consists of a heating chamber $10\frac{1}{2}$ ft. long and a recuperative chamber $20\frac{1}{2}$ ft. long. Each chamber is 7 ft. wide, accommodating two charging trays across the width.

An electric hoist loads the coils on heat-resisting steel trays on transfer cars, which are moved to the front of the furnace, and the work is charged into the furnace on the trays. The tray travels through the recuperative zone, then through the heating zone and across the back end of the chamber, and returns through a soaking section of the heating chamber and through the recuperative chamber on the opposite side of the furnace. When in the recuperative chamber, on its return to the discharge end, considerable of the heat from the annealed coils is absorbed by the incoming cold coils in the opposite chamber. The coils are moved at regular intervals through the furnace and across from one side to the other by mo-

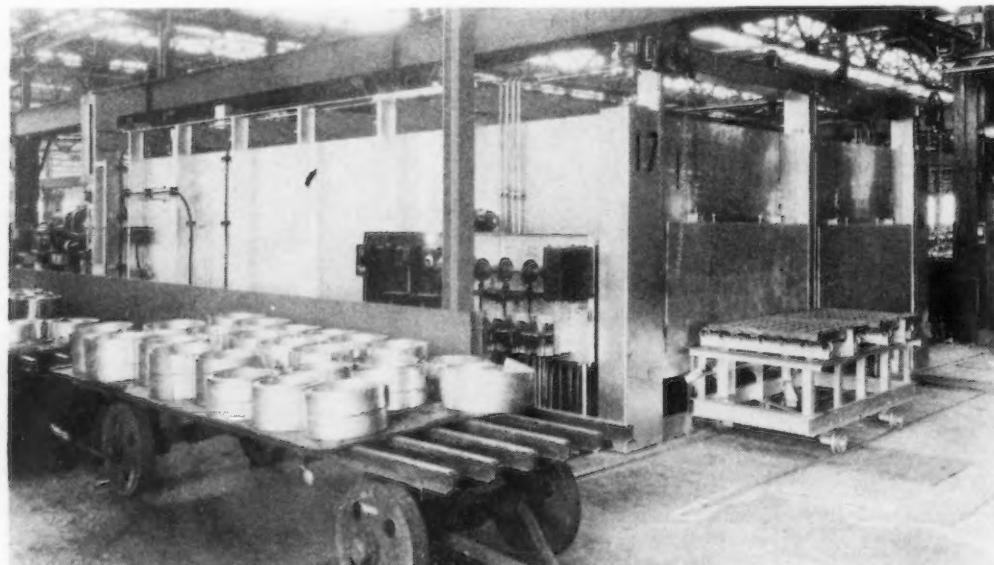
tor-driven pushers automatically controlled, all movements being synchronized and interlocked.

The furnace has three zones of automatic temperature control. The first is in the recuperative chamber, through which the incoming work passes. The second is in the heating chamber and transfer section at the back of the furnace, and the third is in the soaking section of the heating chamber through which the outgoing work passes. The heating elements are heavy cast heat-resisting alloy grids, located in the furnace roof and in the bottom of each heating chamber.

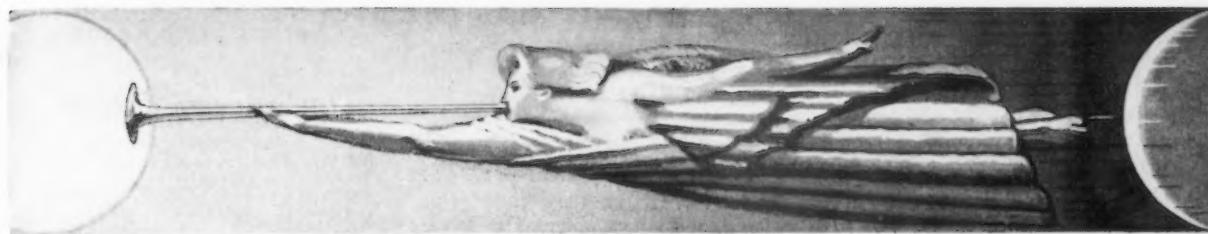
The furnace has a rated production of 6000 lb. per hr. in the two units. The operating temperature varies from 775 to 1250 deg. F. The average time cycle for the complete annealing operation is about 4 hr. 15 min., the rather long cycle affording maximum time for recuperation. Tests have shown

that work annealed at about 1050 deg. leaves the furnace at between 500 and 600 deg., indicating the amount of heat that has been released to the incoming cold charge. Tests, it is stated, also show a remarkable uniformity attained.

The furnace shell is gas tight, so that the furnace may be utilized for bright annealing protective atmosphere.



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NEWS OF THE WEEK

Steel Fabricators Protest Quantity Extras on Plates and Shapes

WASHINGTON, March 19.— Protest against proposed quantity extra on plates and shapes which, it is claimed, would increase costs up to \$8 per ton for steel fabricators was made by V. G. Iden, acting secretary, American Institute of Steel Construction, at the NRA hearing on price differentials. Mr. Iden confined his testimony to discussion of structural shape "uniform extras" published by the steel code authority. He pointed out that they include extras for size, shape, quality and content. Those published in September, 1934, Mr. Iden said, were "just twice as numerous" as in the issue of the preceding year. The objection was directed against extras on small orders of special or individual sizes.

"We are objecting here," Mr. Iden declared, "particularly to the quantity extras, which would have increased costs, in some instances, up to \$8 per ton for our members."

He pointed out that the extras were scheduled to take effect in the third quarter of last year but were suspended at the instance of the American Institute of Steel Construction. The institute membership, Mr. Iden stated, handles 90 per cent of the fabricated tonnage of the United States.

"The figures show," said Mr. Iden, "that the imposition of the quantity extras would be such that it would disrupt the industry, that it is contrary to the method of doing business, and that for many years past and for various reasons we have objected to it strenuously.

The quantity extras proposed by the mills to take effect in the third quarter of last year have not gone into effect because of our protests and they have been postponed quarter by quarter until now they are to go into effect in the third quarter of this year unless they are definitely suspended later on."

Charges Explained

Mr. Iden detailed the proposed extras and pointed out that the rolling mills are now proposing to impose additionally an extra charge of from 10c. to \$1 per 100-lb. when small orders are placed and 5c. per 100-lb. for special mill marking. At some length, he protested against this latter feature and said that "it is hoped to impress upon the managements the vital necessity of extreme care in the reform of their marketing plans that the best interests of the several hundred fabricating shops in this country are not jeopardized."

Fabricating shops, it was stated, distribute 80 per cent of shapes rolled, and meet the keenest competition. Competition between types of construction was declared to be a potent agency in keeping down the price of structural steel and reducing the margin of profit on the business of fabrication and erection.

"This relative position between steel and other materials would be violently disrupted if the cost of the plain material were to be substantially increased and if the cost of fabricating is to be increased," Mr. Iden declared.

To impose quantity extras, it was pointed out, would merely encourage the shops to carry a larger stock of shapes which would involve a greater investment in materials, thereby increasing the overhead of the fabricator. This, it was stated, would prove an especially hard burden at the present time when the volume of business is down to a figure approximating 25 per cent of the normal value represented by the tonnage fabricated and shipped during the 10 years, 1920 to 1929.

"Should these proposed quantity extras be persisted in," Mr. Iden continued, "and should it result therefrom that the warehouse industry is benefited as they confess they hope to benefit therefrom, it will result in encouraging the fabricating shops to stock up and to enter the warehouse business in their localities. That would encourage even stiffer competition among warehouses than extras at present and might still further disrupt the business of retailing structural shapes and plates."

Profit Has Disappeared

It was declared that competition in the fabricating industry has been more than keen and that a margin of profit no longer exists. The cost of fabricating and erecting steel was declared to have been greatly increased through the shortening of hours and the increase in rates of pay, while the NRA has, to date, offered the industry no compensating advantages.

"The proposed quantity differentials have already produced a most unfavorable reaction in the minds of the small fabricators," Mr. Iden pointed out, "and further weakened their confidence in the mills. It is considered by a large

Letters From Readers

"The Survey Racket"

Editor, The Iron Age:

YOU might wish to warn your readers about a new "racket" which has appeared recently in industry. Here is the procedure:

A company operating out of a large Midwestern city writes to some small or moderate-sized manufacturing plant, asking if the owners would be interested in a sale or merger. If the owners are interested, a representative appears in due time, and, after a suitable build-up, in which large figures appear freely, he asks to be given a 60-day option at just about any price the owners want. He then says that he is sure that his principals will be very much pleased by the prospect of acquiring this fine property, on the sale of which the owners are to pay him 5 per cent as agent. This is part of the plan and the stranger's excuse for being in the picture.

Then the pay-off begins. The "financier" says he could not possibly take the proposition back to the firm he is representing without having all possible facts about the plant's worth. "Of course," he suggests, "a survey has been made of the company's physical assets at some recent date?" If not, the matter can easily be arranged. He knows that some of the large companies specializing in this kind of work have little to do right now and, while they wouldn't undertake such a job at a reduced price under their own names, they would permit expert members of their staffs to do the work for some ridiculous low price such as \$500.

The sales talk continues. A survey should be made every few years anyhow. How can a business be run without one? It all leads up to the signing of an option on the property and of a written order to have a survey made. An investigation of the concern which tried this on me revealed the significant fact that although it has made surveys of businesses for the purpose of sale or merger, no sale or merger has ever been consummated. It's just a "gyp" game to get a small plant to pay a fancy price for a survey which is probably worthless or of questionable value. I think your readers should be warned about this "racket."

Respectfully,

One Who Was Not Surveyed

number as evidence of an effort to weaken and eliminate the smaller shops in the country. Practices such as these are working out to the decided advantage of the large manufacturer or merchant and to the decided disadvantage of the smaller industrial units.

"The steel jobber and warehouseman have suffered and are suffering hardships and losses as well. The remedy for that situation, however, can not be found by transferring any part of these hardships or losses to the fabricators of structural steel.

"It is our opinion that a better remedy would be had if the rolling mills were restrained from further acting as retailers of shapes and plates.

"The rolling mills have so drafted their terms of sales as to protect jobbers and warehouses on pipe, sheets, tin plate and similar products which they roll. They could easily and justly adopt a similar policy with respect to shapes and plates by refusing to sell at all in small lots to the ultimate consumer.

"The fabricator of structural shapes and plates should be recognized by the mills as a very necessary agent in the marketing of an important product of the rolling mills. The imposition of quantity extras of the smaller orders for plates and shapes will not accomplish this purpose."

Implement Demand Good at Milwaukee

DEMAND for farm tractors as well as tractor tools and farm implements in general experienced since the beginning of the year by the Allis-Chalmers Mfg. Co., Milwaukee, is almost unprecedented and comparable with the best months of 1929, it is stated by the company. The plow and farm implement production division at La Crosse, Wis., unable to meet the widespread demand with a two-shift working schedule instituted Jan. 14, began operating on a 24-hr. basis on March 11, and increased the working force from 325 to 400 on a production program supported until July or August by unfilled orders now on the books. Deliveries, heretofore at the rate of one carload a day, are being stepped up to 20 carloads a week as rapidly as possible.

The production schedule for the first six months of this year is three times as large as the entire 1934 output. In 1933 the La Crosse plant manufactured 600 units of farm machinery; in 1934, 5660 units were produced, while the

schedule for the first half of this year is approximately 15,000 units. Demand is especially good from Texas and neighboring States for cotton planters and cultivators. The corn belt is calling for equipment, as is the grain belt generally.

Other products in particularly good request are grain drills, tractor plows, disk and spring-tooth harrows, drag harrows, field cultivators, etc. Shipments for export also are increasing. France is taking cultivators; Argentine, plows and cultivators, and Hawaii, cultivators.

Security Bill Would Create Huge Reserve

HUGE Federal reserves totaling more than \$50 billion in 1980 would be accumulated if that phase of the economic security bill dealing with a compulsory system of old age pensions became law in the form suggested in the amendment proposed by the Ways and Means Committee, according to the National Industrial Conference Board. In a recent report the board points out that the greatest problem confronting any old age pension system in the United States is the investment of the vast funds that may be accumulated.

The amendment proposed by the Ways and Means Committee to the economic security bill stipulates a 2 per cent tax on payrolls at the start of the pension program, and a progression of the tax to 6 per cent within 12 years.

The amount of the reserve which would be built up, according to the board, is almost twice as large as the present Federal debt; larger than the total Federal, State, and municipal indebtedness of the country; greater than the national income during the years 1932 and 1933; and 2½ times as much as the total reserves accumulated by all the life insurance companies within the last 100 years.

General Electric Has Increase in Orders

The General Electric Co. had 1934 orders of \$184,000,000, compared with \$143,000,000 in 1933, an increase of 29 per cent. Sales of \$164,797,000 compared with \$136,637,000 in 1933, an increase of 21 per cent. Net profits available for the common stock, as a result of the year's operations, were \$17,151,000, compared with \$10,855,000 for 1933. This is equivalent to approximately 59c. a share, against 38c. in 1933.

PERSONALS

WILLIAM H. SEAMAN, formerly vice-president of Continental Roll & Steel Foundry Co., has been appointed vice-president in charge of rolls of the Mesta Machine Co., Pittsburgh. His entire career has been devoted to the roll business. He started with the Seaman-Sleeth Co., which later became the Pittsburgh Rolls Corp. In 1924, he became vice-president in charge of rolls for the Hubbard Steel Foundry Co., Chicago, and in 1930, when Continental Roll & Steel Foundry Co. was formed, he became vice-president in charge of rolls for the latter concern. He attended Washington and Jefferson College and Carnegie Institute of Technology.

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G. A. SEYLER, of the Lunkenheimer Co., Cincinnati, has been elected president of the Cincinnati branch of the National Metal Trades Association. R. E. LE-BLOND, R. K. LeBlond Machine Tool Co., has been made vice-president, LEROY G. BROOKS, JR., Tool Steel Gear & Pinion Co., treasurer, and O. E. SCHAUER, Cincinnati Bickford Tool Co., secretary.

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ANTHONY S. TEIBERIS, heretofore vice-president and general superintendent of the Master Tool Co., Cleveland, has been appointed general manager of the Columbus Truck & Supply Mfg. Co., Columbus, Ga.

❖ ❖ ❖

EDWARD B. SMITH, formerly with the Jessop Steel Co., has become identified in a sales capacity with the Peninsular Steel Co., Cleveland.

❖ ❖ ❖

JAMES R. BUCK has been elected chairman of the Federal Screw Works, Detroit, and will serve for a time as president. P. E. GARLENT and E. W. STEWART have been named vice-presidents and J. F. SORAUFL, treasurer. R. A. GUNN and E. E. VENDER have resigned as president and treasurer respectively.

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S. A. JEFFRIES has been appointed chief engineer of the Stutz Motor Car Co. of America, Inc., Indianapolis, and will have charge of all engineering and experimental activities. From 1916 until recently he was associated with the Reo Motor Car Co. in development and research work. Earlier he had been connected with Olds-

mobile, Amplex Motor Car Co. and the Apperson Motor Car Co.

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HORACE T. THOMAS, formerly vice-president, director and chief engineer of the Reo Motor Car Co., Lansing, Mich., has retired from the company after having been connected with it since its inception in 1904. After a vacation in Florida, he will go into the automotive engineering field.

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GEORGE H. BUCHER has been elected a vice-president of the Westinghouse Electric & Mfg. Co., with headquarters at New York. Mr. Bucher, who also is president and general manager of the Westinghouse Electric International Co., has been associated with the Westinghouse organization since Sept. 1, 1909. A graduate of Pratt Institute, he joined the Westinghouse Electric & Mfg. Co., East Pittsburgh, as a graduate student. In 1911, he was transferred to the export department at New York, and in 1920 was appointed assistant to the general manager of the international company. The following year he became assistant general manager, advancing to the position of vice-president and general manager in 1932, and to the presidency in 1934.

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THOMAS R. LANGAN has been appointed traffic manager of the Westinghouse Electric & Mfg. Co., East Pittsburgh. He has been employed by the company since 1904, having served two years on an engineering apprenticeship course before entering the service department on road erection and repair work. In 1919 he was transferred to the sales department, and in 1922 was appointed manager of the Syracuse, N. Y., office. He became transportation manager of

(CONCLUDED ON PAGE 67)



W. H. SEAMAN



J. S. STANIER

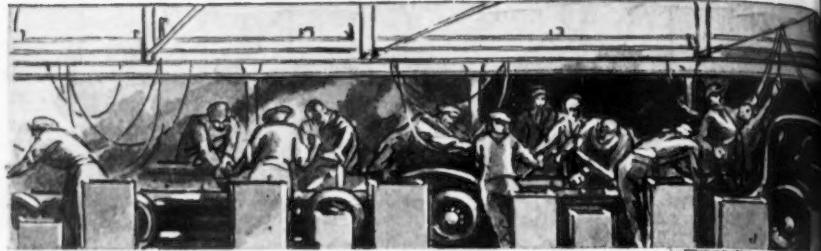
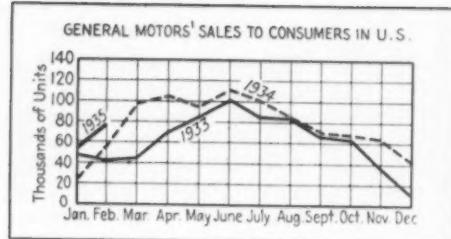


AT LEFT
WILLIAM B.
WESTON, new
assistant to C. V.
McKaig, vice-president
and general
manager of sales of
the Carnegie Steel
Co.

• • •

AT RIGHT
PHILIP M. GUBA,
who has suc-
ceeded Mr. Weston
as Detroit district
manager of sales of
the Carnegie com-
pany. The changes
were reported in
these columns on
March 7.





THIS WEEK ON THE

April Output to Be 435,000 Units; General Motors to Stage Shows

DETROIT, March 19.

THE parade of disconcerting events which trooped by in the last two weeks has not gone unnoticed by the automobile industry. The break in cotton prices, the prediction of another drought the coming summer, the listlessness of the stock market, floods along the Mississippi and its tributaries, and the jumble of obnoxious legislation pending in Congress have all had their effect. Yet no one in Detroit entertains the thought that these factors, either singly or collectively, will bring car sales into a sudden nose-dive and thereby abruptly end what has amounted to a fair-sized boom in automobile manufacturing.

There is, on the other hand, a distinct sentiment favoring a more cautious policy than has prevailed previously this year. Individual companies are scanning retail sales figures daily, ready to adjust production upward or downward to conform to current demand. Car makers, who went "hog wild" in ordering steel in January and February and in building up steel stocks, are inclined to reduce their inventories and stay close to shore. Ford, for example, is reported to have cut its stored steel (of its own make) from over 200,000 tons to around 85,000 tons. Part of it has been used in its own plant and part has been shipped to suppliers.

March production estimates still stand at 415,000 units. In April the total should rise to at least 435,000 units, but beyond next month no definite predictions are being made. The course of manufacturing operations in May and June probably will be determined by the trend of retail sales in the

next three or four weeks. Some manufacturers privately complain that the recent week-to-week gain in retail volume has been less than seasonal, but one might ask, "how steep a rise do you expect, when the industry started the year at an uncommonly high level?"

Despite all the economic obstacles which must be hurdled, the automotive production path through the remainder of the first half continues to appear alluring. Ford shows no trace of a possible letdown from its pace of over 6000 cars and trucks a day; it has not altered plans for building 170,000 units in April. May should be another excellent month, with the schedule tentatively pegged at 155,000.

Chevrolet to Make 125,000 Units in April

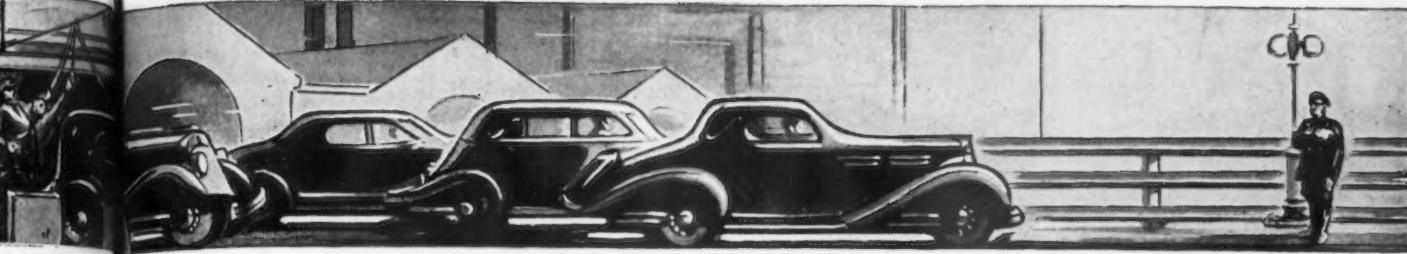
Chevrolet, laboring under the handicap of a late start, seems well on its way toward the assembly of over 100,000 cars and trucks this month, with 125,000 jobs set up for April. May looks good for about 115,000 units. It is said that the Chevrolet sales department has orders on hand for 150,000 Master passenger cars, but the problem over which executives are losing sleep is how much of this business will slip into the hands of Ford and Plymouth while Chevrolet dealers impatiently wait on deliveries. Incidentally, Chevrolet is understood to have built thus far this year 107,000 Standard passenger cars, compared with 110,000 in the entire year of 1934.

Chevrolet hasn't been the only sufferer from a dearth of bodies. Both Pontiac and Oldsmobile have

done their share of swearing at Fisher Body, although they have been notably favored at the expense of Chevrolet, as pointed out in this column last week. On account of the failure of Fisher to come through with a sufficient volume of bodies, the relationship between certain General Motors divisions and Fisher Body could scarcely be described as cordial, according to reliable reports.

What second quarter production will be depends on Ford and General Motors. It is from these two sources, too, that most of the steel tonnage for next quarter will come. General Motors will give sales demand a shot in the arm in April by staging for the fourth consecutive year exhibits of its products held simultaneously in leading cities throughout the country. This form of business-getting has proved its worth, not so much for the sales actually made at the shows as for the prospects to follow up later and for the value of concentrating the public's attention on General Motors cars.

Chrysler's output in the next three months will not equal that in the first quarter, unless retail sales should jump to unanticipated heights. The corporation's field stocks are reported to be the largest in the industry as the result of an early start and the pushing ahead of assemblies, particularly at the Plymouth plant, at capacity during the last three months. Plymouth recently has eased off to about 1500 units a day, five days a week, but Dodge is maintaining a record-breaking gait with assemblies of passenger cars and trucks the past week having averaged 1300 a day. Sales of Dodge trucks



ASSEMBLY LINE

have been so heavy that an addition to the truck plant on Lynch Road in Detroit is to be constructed immediately.

Chrysler Sales Are High

While dealers' stocks are relatively high, Chrysler's retail sales have been of record proportions, running around 12,000 units a week or considerably above the 1929 level. It will not astonish Detroit should earnings of the Chrysler Corp. in the first quarter be within hailing distance of those in the entire year of 1934, which amounted to \$2.19 a share. It has been the objective of the Chrysler management, according to authentic reports, to make a much better financial showing this year than last when earnings declined 21.4 per cent despite an all-time high mark in total volume of business. Various means are said to have been employed to effect savings, such as the elimination from Plymouth and Dodge cars of expensive knee action wheels, the minimizing of tool and die costs for 1935 cars, an edict against capital expenditures for new equipment, and retirement of Dodge bonds, thus reducing fixed charges.

Taking a long range view of automobile production, one is reasonably safe in expecting a high output through the second quarter, a sharp let-down in operations in the third quarter preliminary to fall announcements, and an upturn in the fourth quarter. Under the new plan agreed upon by all manufacturers except Ford, 1936 models will be introduced between Aug. 1 and Nov. 30. Current opinion is that there will be either a New York show about Nov. 1 sponsored by the industry and of national scope or that the traditional New York event will be omitted entirely.

1936 Plans Indefinite

The truth is that plans of most companies haven't yet taken definite shape for next year's cars

By BURNHAM FINNEY

Detroit Editor, THE IRON AGE

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beyond the understanding that announcements will be made before Dec. 1. Those companies which are having good runs on present models will want to continue production as long as possible, leaving only a limited time in which to tool up for new lines. The inclination, under the circumstances, will be to go through the motions of making changes on 1936 cars for the benefit of the public and actually only altering a louver line here or a fender curve there. Such changes would not affect fundamental chassis and power plant features as they now exist. This situation is said to apply particularly to such cars as Pontiac and Oldsmobile, which are experiencing unprecedented success.

This is hardly a picture to please the machine tool trade. Main hope for new equipment buying seems to lie in measures forced on car manufacturers by competitive conditions. Increased labor costs have been working in favor of further mechanization; so has the general necessity for paring the cost of making almost every part which is used in an automobile because of the narrow margin on which the industry is running. Another powerful factor is the fight which Chevrolet and Plymouth will put up to keep Ford from having a "runaway" market.

Machine tool buying has been greater than appears on the surface, although sources of business have been few in number. Lincoln is understood to have completed purchases amounting to about \$100,000. Ford has been placing orders for machines in moderate volume, although no one builder is believed to have shared to a large extent in this business. Ford of England, which is expanding its

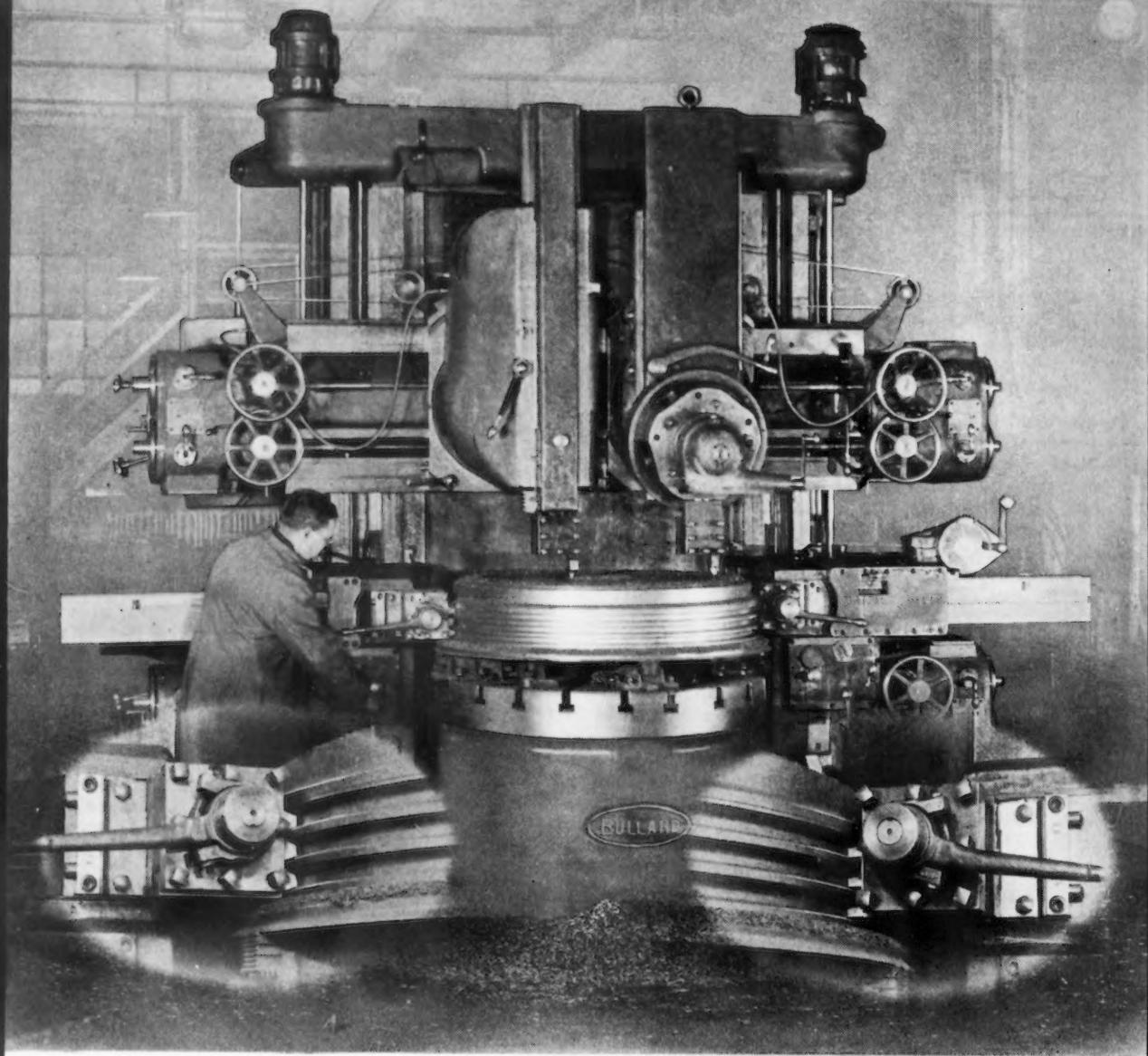
facilities so that a large part of the V-eight car can be made at Dagenham, is expected to make further purchases of equipment in this country. Its representative is again in the United States with headquarters at the Rouge plant at Dearborn.

LaSalle Reduces Prices

LaSalle, in announcing its new cars which in outward appearance are virtually duplicates of its 1934 models except for the turret top, has slashed \$220 from its former prices. List prices now range from \$1,225 to \$1,325. New models are on an 120-in. wheelbase (1 in. longer than last year) and have greater power through increased motor displacement (248 cu. in.), a redesigned rear axle reducing engine speed to 3245 r.p.m. of car travel, steel disk wheels with 7-in. tires and Centrifuse brake drums (contact facing of cast iron) instead of pressed steel drums. The knee-action unit has been strengthened by suspending both ends of the lower wish-bones from solid steel bars securely anchored to the frame. Incorporated in the LaSalle motor is a peak load generator in which current and voltage are regulated to prevent the battery from becoming either exhausted or overcharged under any normal condition of electric load or driving speed.

Price reductions by Studebaker and Nash are understandable when one examines passenger car registration figures for January and finds that the former made a gain of only 19 per cent over the same month a year ago, whereas the industry's gain was 123 per cent. Nash showed a loss from last year on its Nash series. There is another consideration in connection with Studebaker. The write-down in its assets and hence in its fixed charges should put it in a position to make cars far cheaper than heretofore, and it is evidently passing along some of this saving to the public.

RUGGED INDIVIDUALISM—



IT'S a known fact that mass weight properly distributed provides for absorption of vibration with assurance of maintained alignment and continued accuracy under heavier and faster cutting.

The design of Bullard Hydro-Shift Vertical Turret Lathes has taken the weight factor into consideration, and its effective application at essential points as well as the total mass weight provides rigidity with resulting quality of finished work.

For instance — the following standard weights of Hydro-Shift machines are substantially greater than average machines of this type, thereby making possible the use of four heads simultaneously with the left side head making a finishing cut as illustrated.

46 inch machine — 56750 lbs . . . 56 inch — 63250 lbs . . . 66 inch — 69830 lbs . . . 76 inch — 77425 lbs . . . and 86 inch — 87200 lbs.

THE BULLARD COMPANY
BRIDGEPORT, CONNECTICUT



THIS WEEK IN WASHINGTON

NRA and FTC basing point reports provoke bedlam of political bickering — Senate committee asks for Darrow's expert advice.

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Discussion on extension of NRA brings out widely divergent views.

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Spokesman for steel fabricators protests institution of quantity extras on plates and shapes.

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Richberg defends steel code and praises steel industry for contribution to industrial recovery.

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Revision of prevailing wage amendment to public works bill not particularly unfavorable to organized labor.

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was known the reports had been given out. . . .

The remarkable and exhaustive study made by the NRA committee, loaded with information, clearly and accurately set forth, was the object of much favorable comment. . . . It is a compilation that easily excels any preceding effort, a splendid history of the iron and steel industry of the United States from its inception, providing much informative material for even the best versed men in the industry. . . . The report was no doubt responsible for the good press notices that found their way into print. . . . For complicated as the subject is, with its almost innumerable ramifications, the report was so clear and well written that it afforded a definite understanding of

the principle involved. . . . That can be said, no matter what may be done with the reports or what bearing they may have on revision of the steel code. . . . It distinctly was not "just another report." . . .

Prophecy, as usual, would be dangerous, exceptionally so. . . . Just as it would be in trying to predict what Congress will do about extending NRA. . . . Yet extension is expected, despite growing sentiment in Congress for NRA's scrapping. . . . But the act may be considerably revised. . . . So much so, many think, that it might almost justify the piquant simile of Father Coughlin, "as sterile as a Blue Eagle's decayed egg." . . . The Administration has a plan, as Donald Richberg told

WASHINGTON, March 19.—It was no bad guess that the FTC and NRA basing point reports would pull all sorts of distorted publicity and political hysteria. . . . They did just that, and continue to do so. . . . Yet there were counterbalancing influences. . . . For some of the daily reports were intelligently and fairly handled. Even at the Capitol there was at least some sane comment, although it was almost drowned out by a surge of ranting that developed according to schedule. . . . That is, just as soon as it

the Senate Committee on Finance, but it certainly is insisting upon well-defined specifications as was its old practice, now that the honeymoon is over. . . . Realities, like bread and butter, are taking the place of romance and sweet nothings. . . .

The Richberg (Administration) plan would define, as nearly as it can be defined, the meaning of interstate and intrastate commerce. . . . Meaning undoubtedly the dropping of many codes, especially service codes, although Mr. Richberg denies having actually recommended such action. . . . The casting aside of such codes would save the Blue Eagle a lot of grief and therefore likely would be welcome to the Administration. . . .

It is a matter of opinion as to what would come of retail and other codes which cover what heretofore has been generally considered intrastate commerce. . . . NRA thinks code authorities for these lines would conduct the most powerful lobby that ever existed if they thought their codes were to be dropped. . . . It is also planned to consolidate codes for industries employing 10,000 or less, which would mean simplification. . . .

S. Clay Williams would also greatly simplify the codes. . . . The retiring head of NRA centered his recommendation on retention of minimum wages and maximum hours, letting the inefficient minority in business take its own chance on existence, which likely would be decidedly slim. . . . And it may be expected that Sidney Hillman, socialist, and prominent organized labor representative on NRA, will insist on retention not only of these provisions but of service codes, representing some 3,000,000 workers. . . . One bill proposes the 30-hr. week for NRA, and no doubt there are innumerable other proposals lying around the halls of Congress, circus of the nation, with such entertainers as Clarence Darrow telling what should be done with NRA. . . .

Other shows center around hearings on the Wagner labor disputes bill, with organized labor using the NRA Labor Advisory Board as a vehicle for again attacking Mr. Richberg, this time for so-called delay in producing the Administration's proposals for NRA legislation. . . . And former Chairman Lloyd K. Garrison of the National Labor Relations Board telling a committee that Section 7-a could be enforced in "only a handful of cases." . . . He took the same position as his successor, Francis Biddle, who in urging the Wagner bill, said that unless Section 7-a is strengthened as proposed by the bill, the National Labor Relations

Board may as well go out of business. . . . This was sweet music to organized labor. . . .

But labor hit a sour note when the "prevailing wage" amendment in the public works relief bill was knocked into a cocked-hat by the Administration forces and allied Republicans. . . . The substitute, known as the Russell amendment, was a yes and no amendment at that. . . . For it authorizes the President to pay either the prevailing wage or a security wage and provides the wages shall "not affect adversely or otherwise tend to decrease the going rates of wages paid for work of a similar nature" . . . and the amendment provides that the prevailing wage must be paid workers on "permanent buildings for the use of any department of the Government of the United States or District of Columbia." . . . A few more "defeats" like this and organized labor would have everything it could possibly desire. . . .

Congress would have to stay in session from now until doomsday, at its present rate of progress—or lack of it—to get through even a fractional part of the heavy legislative program laid before it by the President. . . . The best bet is that much of this legislation will be shelved for this session, especially that part of it which is not even half baked. . . . The 30-hr. bill and the Wagner bill will likewise go on the shelf—neither is an Administration bill. . . . Despite Administration's hot drive for utilities legislation, designed to kill holding companies, the general view is that the present plan will be modified considerably, and possibly enacted with holding companies still on the job for at least several more years. . . . Monetary legislation, including the Eccles plan, criticized by many as being inflationary, seems to have less chance of enactment as a more conservative Administration tone develops. . . . Congress doesn't want to enact taxation law but may have to. . . . Either that or inflation is inevitable unless the tremendous outpouring of Federal money is quickly checked and the current balance written in black, not an early possibility. . . . Strong bonus sentiment exists in both branches of Congress, one plan involving huge borrowing and the other outright inflation; the latter is favored by the House but not by the Senate. . . . the President is reported to be ready to approve a compromise measure and in the past has said it would be approved only through provision for taxes to meet bonus. . . . Meanwhile, with the approach of spring, recovery begins to show more life, but it is

not in full bloom like the jonquil. . . . Perhaps still hesitant for fear of a legislative frost-bite.

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Employees May Strike But Employer Is Still Obligated to Bargain

Employees may go on strike and employers may make serious efforts thereafter to adjust differences but, failing, still are obligated to continue bargaining. This ruling of the National Labor Relations Board was announced last Saturday. It concerned the case of Resnick Brothers, manufacturers of pocketbooks in New York and Holyoke, Mass. Employees at both plants joined a general strike called by the International Pocket-book Workers' Union.

The board found that for two weeks after the strike Resnick Brothers had made "a serious effort to adjust differences through negotiations with the union." After that time the company, so the board said, refused to have any further dealings whatever with the union. The company closed both plants and moved to Syracuse, N. Y.

Despite its efforts to settle the strike, the board held that the concern had violated its obligation under Section 7-a by refusing to deal with the union after the second week of the strike. It ordered the concern to meet with the union in a collective bargaining conference with the understanding that if satisfactory terms could be reached the employees formerly employed at Holyoke, who wished to move to Syracuse, should be put to work at Syracuse. The board claimed that the courts have uniformly ruled that employees on strike retain their status as employees "and are entitled to assert the rights granted by the statute."

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Greer Steel Co. Exonerated by Steel Board

The National Steel Labor Relations Board, in a decision announced last Thursday, exonerated the Greer Steel Co., Dover, Ohio, of charges of discriminating against certain employees, members of Tuscarawas Lodge No. 173, Amalgamated Association of Iron, Steel and Tin Workers, for union membership and union activities. The workers included Ernest Prosser, an employee at the plant, and certain oil men. The decision said the oil men were merely given work that was somewhat different from what they did previously, but that the change was occasioned by the economic requirements of the mill and not be-

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cause of their union affiliation and union activities.

The board said that Prosser apparently was notified by the company to report to work at several different times in accordance with the rules of the company at the address and in the manner designated by Prosser. It was stated, however, that there was some uncertainty about the proper notice having been given Prosser by the company, even though it was admitted that the company attempted to give the agreed notice. The board recommended that Prosser be reinstated. Hearing on the case was held in accordance with an agreement made when the board settled differences between the Greer company and its employees which led to a strike in the early part of August, 1934.

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Collective Bargaining Can't Change Code Agreements

Agreement reached by collective bargaining between employers and employees cannot override code provisions. Decision to this effect has been made by NRA in upholding a ruling of its Industrial Appeals Board. The board had rejected the appeal of the Associated Express and Truck Owners of New Jersey. The code for the trucking industry provides that weekly wages of drivers as of June 17, 1933, may not be reduced unless hours are reduced 15 per cent or more. A union agreement signed April 1, 1934, provided for a \$38 weekly wage for drivers. This agreement meant higher earnings for 240 men and lower earnings for 260 than the code provision would give them. The company asked for exemption from the code provisions where they were inconsistent with the agreement.

In denying the exemption, NRA held that the code provisions must govern regardless of any other agreement. With this view the Industrial Appeals Board agreed. The Appeals Board said "If the provisions of 7 (a) are effective they must be effective for all purposes and the right to 'bargain collectively' does not include a right to bargain away restrictions upon hours and wages and other conditions of employment which Congress by the same section of the same act specified that employers would be required to observe."

Inland Steel Co., Chicago, has lighted another blast furnace, giving it three active stacks out of a total of four.

Richberg Defends Steel Code Before Senate Committee—Compliance High

WASHINGTON, March 19.—Defending the NRA for permitting the multiple basing point system to be continued under the steel code, Donald R. Richberg told the Senate Finance Committee last week that there is not an industry in the country that can present a better record of what has been accomplished and could be accomplished under the recovery act than the iron and steel industry. Testifying before the committee in urging extension of NRA, Mr. Richberg's remarks were made just prior to release of the widely differing reports on the basing point system presented by the NRA and the Federal Trade Commission. These reports, which were discussed at the hearings, were summarized in THE IRON AGE last week.

Mr. Richberg's tribute to the industry was in reply to attacks made on it by Senator Borah and others, as well as in refutation of charges that the multiple basing point plan was developed under the code. He pointed out that the system developed from the FTC cease-and-desist order of 1924 against the Pittsburgh-plus system and that there was "no attack upon it, right or wrong, from the Federal Government during this entire development."

He declared that when the code was offered it presented nothing except the existing system. "It did not present," he said, "a new monopolistic basing point system, or anything of the sort."

He explained that the only question legally arising was whether this voluntary agreement was lawful. If it was monopolistic, he stated, sanctioning of it under the code would not make it lawful. He expressed the view that, as the result of the NRA and FTC reports, there will be a thorough ventilation of the system as an economic and legal problem. Mr. Richberg, in reply to a question by Senator King, said that it is "not the simple problem that those who simply denounce it without knowing anything about it would have you believe." Senator King had previously stated that the system would be thoroughly investigated before the finance committee.

No Opinion on Validity

Mr. Richberg said he would not express any opinion on the wisdom or validity of the multiple basing point system, but he pointed out

that it was the choice presented to NRA when the steel code was submitted. Outlining the opportunity to put thousands of men to work under the code at higher wages he inquired "if there is a single man in this committee or Congress . . . who, faced with the proposition of putting 75,000 people to work at better wages, would have refused to take the steps necessary for that purpose, merely because he wanted to have fought out right then and there whether the system that had been in operation for 10 years was monopolistic or not."

Mr. Richberg recited accomplishments of the industry under the code in the way of increased wages, payrolls, production, etc., and in declaring no industry in the country can present a better record gave his reason for what the industry did. He said it was because the industry was now integrated that it could operate as a whole and police its operations as a whole, "so that we have practically 100 per cent compliance in this industry."

Mixing his praise with criticism, Mr. Richberg said that "it is perfectly obvious to anyone who studies the records of the steel industry that the prices have been more or less artificially controlled in that industry by some means or other, but the point I would make to the committee is that there is nothing in the code that authorized such control. The code provides for a competitive system."

Mr. Richberg said there are advantages under the basing point system which may be regarded as artificial. One reason, he stated, for the insistence throughout the industry, big and little, upon the maintenance of system is that the industry "and all its satellite industries" grew up under it. It would involve, according to the industry, he declared, tremendous dislocation of industrial operations and widespread unemployment in one place, taken up by new employment in another, to suddenly change the pricing system. This, said Mr. Richberg, is a perfectly sound reason as far as the industry is concerned, "regardless of monopolistic effect."

Price Rise Not Large

Denying charges on the floor of the Senate that the code permitted price increases of as high as 100 per cent, Mr. Richberg said, "This (CONCLUDED ON PAGE 68)

Steel Basing Point Reports Provoke Mixed Comments in Washington and Throughout Industry

WASHINGTON, March 19.—Now that the widely differing steel basing point reports of the Federal Trade Commission and the National Recovery Administration have been made public, the question arises as to what will be done with them.

As was to be expected they have already been tossed into the political arena. Hardly had they been released before copies of the reports were sent to the Senate Committee on Finance which is considering legislation for extension of NRA. They even formed a basis of considerable discussion before they had been published.

Darrow Called In

From the committee's attitude, which has been reflected in recent speeches on the floors of Congress, it became clear that the reports would bring forth hostile comment on the industry. To add to the harangue and the campaign of attack, the committee proceeded to call before it Clarence Darrow. His well known socialistic views were strongly pronounced in the report of the Darrow board on the steel code last year. Had recommendations of the board which he headed been adopted there would be no steel code. For they would have eliminated all save the labor provisions. It was a ranting document directed against "big business," loaded with charges that the steel code promoted monopoly, suppressed small enterprise, etc. It constituted the theme song of the board in its general report which so enraged Gen. Hugh S. Johnson that he asked the President to dissolve the board. It was dissolved.

Yet Mr. Darrow was brought before the committee to resurrect the tirades of his board. There will be other witnesses of like views. Then, too, there is the recently introduced Bankhead-Hudleston bill, unconstitutional though it may be to compel quotation of prices f.o.b. at points of production, or an f.o.b., mill basing system so strongly upheld by the Federal Trade Commission and so sharply challenged by the NRA.

The commission, seeing the legal obstacles in the way, however, did not recommend the f.o.b. mill base system. Rather it wanted the President to remove executive sanction of the multiple basing point system. This sanction, so the commission contended, is given under the code. The commission wants the multiple basing system brought to a test under the anti-trust laws. And incidentally the commission again makes it known that it wants jurisdiction over trade practices. It is hoping to recover this jurisdiction and conceivably thinks there is a prospect of doing so in view of growing sentiment in Congress for scrapping NRA.

Institute Answers FTC Report

The FTC attack on the basing point method of quoting prices in the steel industry was branded as "biased, inaccurate and misleading" by the American Iron and Steel Institute. The statement said in part:

The commission does not appear to have studied either jointly with the National Recovery Administration or otherwise the questions referred to by the President, and the report made by the commission to the President, if judged from its press release, is not a report on the study of the basing point system but is an attack on codes and the codification of the industry under the National Recovery Administration, with particular reference to the steel code.

The commission seized upon the instruction to study the basing point system as a pretext to launch such an attack. Moreover, it is a biased, inaccurate and misleading statement regarding the basing point method of quoting prices and the operation of the steel code as an example of the codifications of industries under the NRA.

A glaring instance of the misleading

statements contained in the report is the reference to alleged excessive price increases on certain classes of products sold under Navy specifications to the United States Navy Department. It is impossible to make any comparison between the extras applicable to certain classes of products prior to and subsequent to Sept. 1, 1934, on which the commission assumed to base its calculation of such increases in extras, because a change made by the Navy Department in its specifications for such classes of products had the effect of creating entirely new products, involving much more exacting conditions in manufacture than had previously existed. No better example of lack of study or deliberate unfairness could be found.

Charges in the release that the board of directors of the American Iron and Steel Institute, as the code authority under the steel code, has withheld from the Federal Trade Commission any evidence pertinent to the study which the commission was directed by the President to make is wholly without foundation.

The charge that the basing point method of quoting prices is only a device for price-fixing is entirely unwarranted.

President's Position Difficult

It is clear that the President's position is not an easy one. He has not made known whether action on the reports will be left to Congress. Even if the President were to make definite recommendations to Congress, the latter has lately been given to jumping the traces, and might decline to adopt the recommendations. If the President were to submit recommendations of his own it is evident by reason of the conflicting character of the two reports that he would have to reject the plan of one or the other Governmental agency. It is difficult to see how a compromise could be reached.

Pittsburgh Prefers Status Quo

PITTSBURGH, March 19.—The basing point reports of the NIRB and the Federal Trade Commission have met with an unfavorable reaction here. Producers both in this district and at Youngstown are much disturbed over the pro-

posals of the two Government agencies and, though heretofore they have consistently "played ball" with the Administration in the interest of recovery, they are now in a mood to fight for what they believe is their very existence. It is

not now a question of the code, but of self-preservation.

The prevailing attitude here is that if the Administration continues to patronize labor and to demand that industry guarantee minimum wages and maximum hours per week, then industry must have some means of stabilization. The proposals of the two Government bodies, however, would bring disorder and dislocation rather than stability.

The steel industry in this district resents the efforts of Washington to split hairs on the economics of basing points when it is oblivious to economic principles in other fields. The Administration recently cited the reduction in duties in the Belgian trade agreements as a means of lowering building costs, though the real reason for high construction costs is not prices but

high labor rates, not merely in industry but in the building trades. Washington is conspicuously silent

regarding the uneconomic wage rates saddled on the country by the autoeratic building trade unions.

Reports Contrasted at New York

NEW YORK, March 19.—The recommendations in the reports of the Federal Trade Commission and the National Industrial Recovery Board well illustrate the contrasting attitudes of the two bodies, in the opinion of the steel trade here. The recommendation of the Trade Commission is negative; that of the NIRB is constructive.

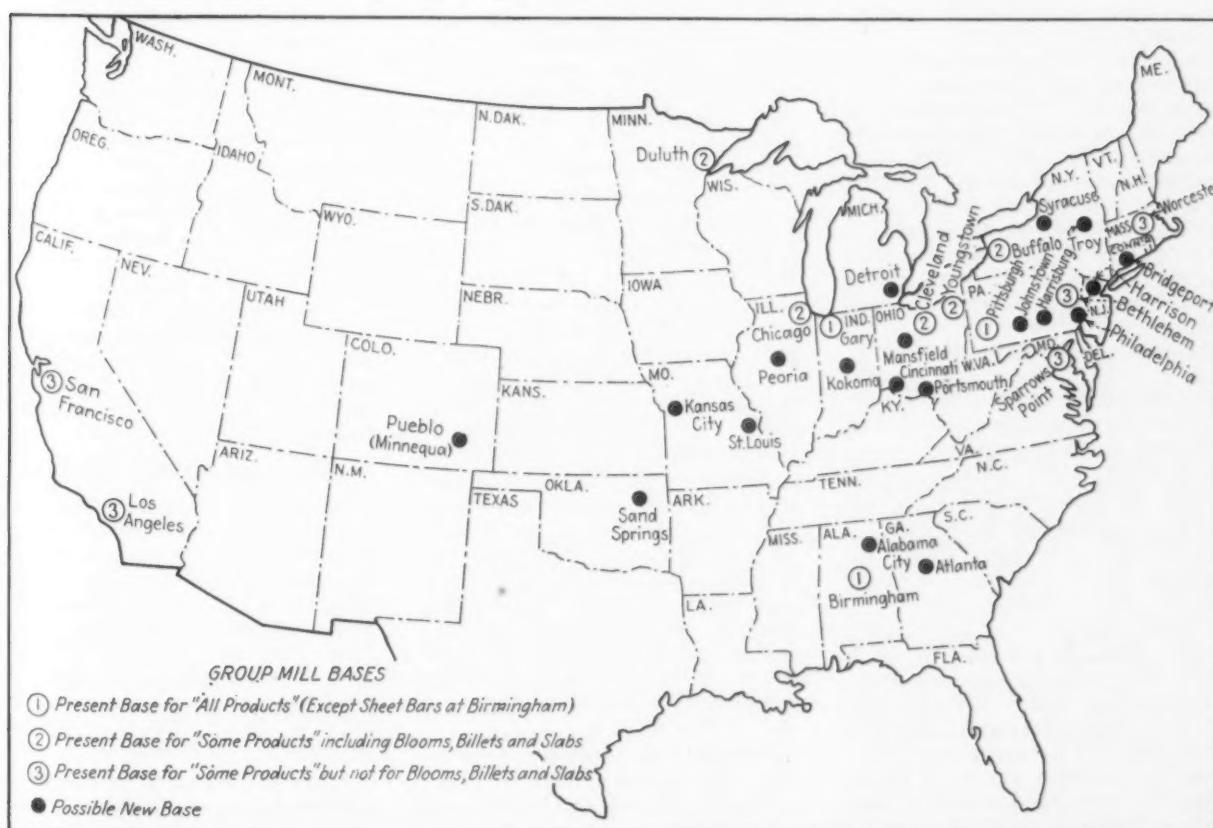
The commission asks that the express sanction of the price control features of the steel code, namely the exemption from the provisions of the anti-trust laws contained in section 5 of the Na-

tional Industrial Recovery Act, be eliminated from the code so that the multiple basing point system may be exposed to legal attack. The board, on the other hand, suggests the adoption of a group mill basing system which would add from 19 to 35 new bases to the present basing points and would limit freight absorption to \$5 per ton. In other words, no producing company would be permitted to cut base price more than \$5 a ton on any business without reducing the base price in its own group zone.

This recommendation does not

THE proposed group-mill basing system, as shown by this map, would necessitate the establishment of 19 entirely new group-mill bases, and the expansion to include additional products of 10 existing basing points for such products. This method would leave only approximately 1 1/4 per cent of the country's rolling mill capacity more than 50 miles from a group base. Canton, Massillon, Lorain and Shelby, Ohio; Coatesville, Glaspark and Steelton, Pa.; Anderson and Muncie, Ind.; Moline and Waukegan, Ill., and Trenton, N. J., are already basing points on some products and should continue as such in the board's opinion. The NRA report defines the system as follows:

"This proposal does not apply to pig iron and wrought iron, nor to those standard rail products now sold f.o.b. mill. Group-mill bases shall be established as follows: (a) within 50 miles of each town at any time containing a total capacity for producing 20,000 tons per year or more of iron or steel ingots and also containing facilities for rolling or otherwise shaping such ingots into blooms, billets, slabs, sheet bars or other primary or semi-finished forms it would be required that there be a group mill base for which base prices shall be filed for each product produced at any plant located nearer thereto in terms of (carload) all-rail freight than to any other group mill base; (b) all existing basing points other than those which may be designated as group mill bases in (a) above shall become group mill bases for which base prices shall be filed for any product now based at such points which is produced at any plant located nearer thereto in terms of (carload) all-rail freight than to any other group mill base."



strike the steel trade as extreme, though in view of the confused situation at Washington, there is little disposition to make either affirmative or negative comments for publication. It is borne in mind that all price control features may be eliminated from codes by Congress, and hence there is no particular enthusiasm over experimenting with a new system which, regardless of its possible merits, would necessarily introduce new complications. On the other hand, the steel trade is ready to take its chances with the law if the present sanctions of the recovery act are removed and the commission carries out its threat of prosecution.

Pittsburgh Plus Never Tested in Courts

In this connection it will be recalled that the decision of the commission in the "Pittsburgh plus" case was never tested in the courts. Steel companies believe that they have the right to sell at any price that will bring them business in the face of the competition that they encounter. They contend that this is the natural attitude of all sellers and accounts for the evolution of the basing point principle.

A producing point with a relatively small capacity does not have to sell at the same net price at mill as a district with surplus capacity. It will lower its price only enough to capture the tonnage it needs. And sometimes no concession is really required, since the demands of its own district may so greatly exceed local capacity as to make it unnecessary to handicap invaders. Steel demand is variable and has a habit of shifting from one area to another. At times one relatively restricted territory may be by far the most active source of business in the country. One needs only to recall that in the past couple of years "all roads have led to Detroit."

A Change of Form, Not of Substance

Possibly a Government agency could force the steel industry to quote on an f.o.b. mill basis, but it could not dictate the prices that would be so quoted. Hence the change would be one of form rather than substance.

If prohibition of freight absorption were coupled with an f.o.b. mill basis, then perhaps something approaching what the Trade Commission regards as ideal would be brought into existence. The National Industrial Recovery Board, however, points out that prohibition of freight absorption would

probably be held unconstitutional and would contravene the terms of existing law which accords the privilege of making price discriminations "in good faith to meet existing competition." Moreover, the effects of such a change, according to the board, would be unpredictable, "since the differences in prices between different localities would be in the nature of the case uncertain and subject to unpredictable change. It is uncertainty and instability in price relationships which would constitute the most serious objection to such a system from the standpoint of fabricators, who are less interested in the absolute level of prices than in being able to count on the relationship between prices paid by themselves and by their competitors."

The Economics of "Genuine" Competition

The recovery board also attacks the thesis that a uniform f.o.b. mill price would necessarily be produced by "genuine competition," as contended by various academic economists.

"Competition alone, completely uncontrolled, would not produce an orderly basing point price system, because it would not produce any orderly system on a uniform plan. But neither would it, in an industry of this type," says the board, "produce an unqualified uniform mill base price system, or a uniform f.o.b. mill price system, and it would naturally produce freight absorptions or discriminations such as constitute the most characteristic feature of the basing point system, though not in anything like such systematic form."

To illustrate the reasons for its view, the board points out the peculiar characteristics of the steel business.

In the first place, steel competition centers more closely in price than competition in general manufacturing. In some steel products quality differentials are so slight that a very small difference in price is absolutely decisive in sales.

In the second place, a large part of the costs of production is constant, irrespective of the volume of production, with the result that additional sales do not occasion any added costs of the constant variety. Constant costs must be covered out of total sales, but there is no particular quota of them which has to be covered from any particular sale.

Thirdly, the industry includes localities where several competitors are grouped and others at which there is only one producer.

In the latter case, the only kind of competition is competition met at a distance, while in the former case both nearby and distant competition may be met.

Fourthly, competition at a distance is the kind in which, in order to reach out a little farther and acquire some additional business, a producer will be willing to accept a lower net yield than the minimum he must receive on the average from his whole business.

Fifthly, freight rates are substantial relative to prices, with the result that a difference in freight rates may be just as decisive as a difference in prices in determining which producer will get an order. At the same time the difference in freight rates may be less than the margin of difference in net yields that a company is willing to accept on different portions of its business in an attempt to cover its constant costs as best it can.

Freight Absorption a Natural Result of Bona Fide Competition

In summing up this commentary, the recovery board says that in the steel industry "discrimination and freight absorption are natural results of bona fide competition. They result because competition acts with different force in different parts of the market."

"The theory that genuine competition tends toward a uniform mill base or f.o.b. mill price, and is inconsistent with any discriminatory price structure, appears to be logical," the board states, "for competition which fulfills two conditions. The first is that all the competitors who have any effect on the price structure are located at the same shipping point. And the second is that producers have no problems of constant costs, but operate under such simple cost conditions that the minimum price at which it pays a producer to take, for example, a single large order, is the same as the minimum price which he must receive, on the average, from his entire output, in order to make it worth while continuing in production."

Extras and Small Consumers

Throughout its report the recovery board shows a grasp of the economics of steel marketing that is conspicuously lacking in the commission report, according to the views of the local trade. The Trade Commission has put its finger on vulnerable points in the steel code, as was to be expected, but its interpretation of these weaknesses is misleading.

It takes particular exception to certain advances in extras. But the discovery that a few increases

in extras were heavy does not necessarily prove anything. The extra structure that existed prior to the adoption of the code contained many inequities because, like Topsy, it had "just growed." Under the code, extras have been given special study by a technical committee and have been revised from the point of view of costs rather than precedent.

It is surprising that the commission, which poses as a defender of the small consumer, should make such an issue of extras, because code enforcement has meant the imposition of extras on all buyers regardless of size. Prior to the code many powerful buyers were able at times to force mills to waive extras, thus increasing their advantage over smaller buyers. What applies to extras applies equally to base prices. Prior to code control, the large buyers with "attractive" tonnages at their disposal were frequently able to purchase at prices considerably lower than their smaller competitors were able to obtain. Under the code a single base price applies to all buyers, regardless of size.

Public Utility or Competitive Enterprise?

The Federal Trade Commission has much to say about "artificial" transportation charges. Since mills quote delivered prices, it is difficult to see how the freight charge can be the affair of anyone but the producers. Of course, what the commission may mean is that the delivered price is sometimes higher than it would have been if the mill which took the business had quoted the lowest ex-

isting basing point price. The commission specifically complains because the base prices of one basing point mill may be continuously higher than that of another though the former's costs are lower. Is one to assume that prices of steel, like the service of a public utility, are to be determined by costs alone, or should the forces of competition determine price relationships? Occasional forays of the low cost mill into the territory of the high cost mill do not prove anything. If the low cost mill wished to make a permanent addition to the territory in which it has a competitive advantage it would lower its base price. One needs only to recall that within the life of the code the Chicago differential over Pittsburgh in plates, shapes and bars was reduced from \$2 to \$1 a ton.

If costs, and costs alone, are to determine the level of prices, what point is there in the commission's condemnation of regulation as opposed to price competition? Cost determination of prices implies regulation; it is the antithesis of price competition.

At no time does the commission concede the importance of open prices to the small consumer. Under the code, buyers, as well as sellers, know what prices are being paid. The worst form of discrimination, secret price chiseling, has been largely eliminated. The powerful buyer has lost one of his greatest advantages over his smaller competitor. This advantage is unfair and bears a strong resemblance to rebating, formerly practiced by the railroads.

turer, who is compelled to stand or fall in a struggle for the survival of the fittest.

Motor car companies feel that the steel industry in its code has tried to support by artificial means what sooner or later will yield to the workings of economic law. Car manufacturers are not necessarily committed to a specific plan for pricing steel. Their chief and only concern is to get the lowest possible prices delivered in their plants. This is not possible so long as they must pay for steel made within a stone's throw of their offices as though haulage from Pittsburgh to Detroit were involved. They want a Detroit base price on all steel products rolled in this district and will not be satisfied until they get it.

They are particularly resentful of the inflexibility of the steel code which prevents the granting of preferential prices to large users. A prominent car maker stresses the fact that the automobile industry is selling steel to the public, and that the sale is in larger quantities per car than a few years ago because of the increased weight of the average vehicle. Pressure of higher costs of materials, parts and labor upon motor car companies has been so terrific that the savings which might be effected by an easing of price provisions in the steel code would loom as important.

Contrary to the belief in certain quarters, establishment of Detroit as a steel basing point wouldn't satisfy as many users as appears at first thought. Ford and Chrysler would be the chief beneficiaries, as well as the Chevrolet gear and axle plant in this city. General Motors plants outside Detroit, however, would be at a disadvantage because they would have to pay a larger differential for steel over Detroit competitive plants than they do at present. And after all what concerns the car manufacturer most is to keep his cost of steel on a level with that of his competitor. With a Detroit base price prevailing, automotive parts companies at Flint, Jackson, Lansing and other points in southern Michigan probably would have to pay \$2.50 to \$3 a ton more for steel than rival companies in Detroit whereas now the differential is only \$1.

Ford professes to be disinterested in the entire proceedings since it soon will have its continuous strip mill in operation and will be rolling a large part of its steel requirements. On the other hand, Ford still will have to buy sizable steel tonnages in the open market when its production ap-

Detroit Sees Basing Point Established There

DETROIT, March 19.—No matter what changes may be made in the steel pricing system as a result of the FTC and NRA reports the local steel trade is convinced that Detroit will continue to grow rapidly as a steel-producing center. Ever since the steel institute's statement last week, Detroit newspapers have been busy picturing this city as a future Pittsburgh as well as the focal point for automobile manufacture.

While admittedly enthusiasm ran away with sober judgment, nevertheless there is every reason to believe that keener competition for automotive steel tonnage inevitably will force steel companies with distant mills to build plants

in or near Detroit. It isn't so much a matter of any price advantage which might accrue as it is of being located in customers' backyards where quick service and close personal contacts with the consuming trade mean additional business.

The automotive industry, of course, is unrelenting in its opposition to the present steel code structure. Car manufacturers have perhaps the simplest of all NRA codes, the provisions being confined to setting maximum hours and minimum wages and to outlawing child labor. No attempt is made to regulate prices or interfere in any way with free and unrestricted competition. No protecting arm is thrown around the small manufac-

proaches anywhere near the current rate and it would like to see steel sold on a Detroit base.

One should not forget that the larger Detroit steel mills are interested in maintaining their competitive positions in markets outside the local area. For this reason they are not so sure that establishment of a Detroit base price or of f.o.b. mill prices would bring them any real benefits. The

gain at home probably would be lost in territory farther afield.

The general conclusion though is that the reports of the Government agencies have brought much nearer recognition of Detroit as a basing point for finished steel products made in this district and that, regardless of what is done or not done, expansion of steel-making facilities at Detroit in the next few years is inevitable.

Cleveland Condemns New System

CLEVELAND, March 19.—Emphatic disapproval of the group mill base system proposed by the NRA and of the elimination of the multiple basing point system as advocated by the Federal Trade Commission is voiced by steel producers in this territory, who feel that the present pricing system has proved satisfactory. Changes in the system now in effect are favored by some consumers not located at basing points, who expect that they would be benefited should new basing points be fixed in places where their plants are located or nearer thereto than at present.

Producers contend that the present basing point system is sound and urge that no radical changes should be made in it, especially during present trying industrial conditions. Either of the proposed systems, it is pointed out, would narrow down the sources of supply and would result in less price competition than at present. Consumers commonly object to a restriction of their sources of supply.

Under the NRA plan, sheet steel would be more largely affected in Ohio than other products, as Youngstown, Cleveland and some other Ohio cities would be made

basing points. With a provision prohibiting a manufacturer from absorbing more than \$5 a ton in freight, the market of most mills would be narrowed and competition would be reduced. Ohio mills would be unable to ship sheets to New York, Philadelphia, Baltimore and other New England consuming points, and they would be shut out of some rather important consuming points west of the Mississippi River. Mills that are so located that they could not sell all their products within the area to which they would be restricted either would have to quit business or build fabricating plants to consume their own products.

Pointing out that it is the average price that counts, producers declare that if their selling prices in their nearby selling area are reduced by being deprived of the advantage that accrues from the use of say a Pittsburgh basing point, their prices would be so low that they could not afford to compete for shipment to points where they would have to absorb considerable freight.

Should consumers be unable to secure all the steel they need from mills not absorbing over \$5 in freight they would have to pay the premium prices to get steel from mills having higher freight rates.

Another angle in the matter is the possible disturbance of freight rates. A railroad, in order to increase its business, might not need much pressure from a mill to reduce a rate so that there would not be over \$5 a ton to be absorbed for shipment to certain points. The reduced rate would go to the Interstate Commerce Commission for approval and the commission would become a party to a controversy involving the steel basing point structure, thus bringing another Government agency into the picture.

Chicago Doubts Benefit of Change

CHICAGO, March 19.—Opinion among steel producers here veers strongly to retention of the code and price stabilization, though some changes are eagerly sought. In a more or less self-contained area like Chicago there is clamor for an effective limit on freight absorption, and both cross-hauling and fabrication in transit, which has extended to automobile parts, are looked upon with dis-

favor. However, lines are closely drawn here as between strictly local mills and those companies that produce here and at other centers. Land grant rates are also disliked.

Confusion is resulting from re-entry of consideration of water-and-rail and water freight structures. There is opposition to quantity price differentials, though favor is found for wider differ-

Who Wrote NRA Basing Point Report

R W. SHANNON was identified with the American Sheet & Tin Plate Co. for 16 years, resigning as Philadelphia district sales manager in 1932 to engage in business for himself. He worked in steel mills two years and is author of "Sheet Steel and Tin Plate," published in 1930 by the Chemical Catalog Co., New York. Mr. Shannon was born in 1895 in Denver and attended Princeton University. He came to the NRA when it was organized, as an assistant to former Divisional Administrator K. M. Simpson and as a deputy administrator has taken a prominent part in NRA work on the steel code.

DR. J. M. CLARK, professor of economics at Columbia University since 1926, is acting as special adviser to the research and planning division of the

NRA, and is president of the American Economic Association. He is author of outstanding works on economics. He was economic consultant to the National Planning Board, subsequently the National Resources Board, from Jan. 1, 1934, to September, 1934. Doctor Clark received his A.B. degree from Amherst College in 1905, A.M. from Columbia in 1906 and Ph.D. in 1910. He was instructor of economics and sociology at Colorado College from 1908 to 1910 and associate professor of political economy, University of Chicago from 1915 to 1922.

DR. R. M. SHARP was among the original members of the NRA Legal Division and served as legal adviser in the formulation of the important early codes, including steel.

He was born at Madison, Wis., in

1897, and was graduated from Amherst College in 1918 and from the Harvard Law School in 1923. Doctor Sharp practiced law in New York from 1923 to 1925. From 1925 to 1926 in the law faculty of the University of Iowa, and was a research fellow at Harvard Law School, 1926-1927. He was a member of the law faculty of the University of Wisconsin, 1927-1933, and has been at the University of Chicago since 1933.

BURR TRACY ANSELL is division counsel of the NRA legal division with which he became affiliated as assistant counsel in 1933. He was graduated from Harvard College in 1926 and from Harvard Law School in 1929. From 1929 to 1933, he was a partner in the law firm of Ansell & Ansell, Washington, and an instructor at Washington College of Law.

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entials to such as jobbers who have grown up with the industry and who actually perform service in distributing steel.

The entire problem of code revision is under close study at this moment. First reactions are that the code has been in effect long enough to disclose its weak spots and proper revision of those would not include revision of price quoting methods, for after all mills cannot assume responsibility for the geographical location of consumers. There is some sentiment in favor of applying the code only to carload and larger lots.

However, producers are inclined to accept most of the code structure as it now stands. They want stabilization and they profess to

see no particular advantages in introducing changes, at this time, in current practices of making quotations. They will resist any changes that will take from them the opportunity to run their own businesses.

It is conceded that ways and means of circumventing codes are being found in increasing numbers.

There is no quarrel with the idea of minimum wages and maximum hours. Section 7-a should be clearly defined, in the opinion of producers, and it is "thumbs down" on the Wagner Bill.

Objections to control of capacity and production depend upon whether or not a mill's setup is well diversified among the products which have been moving best.

ture of such products with respect to the primary distribution thereof."

Flexible Metal Hose and Tubing: The supplementary code authority for the flexible metal hose and tubing manufacturing industry has applied for approval of its \$7,650 budget, and the basis of contribution, for the period from April 1, 1935, to Dec. 31, 1935.

Metallic Wall Structure: W. C. Connelly, Cleveland, formerly Administration member of the metallic wall structure code authority, has been appointed impartial agent to determine violations of the code by assentors to that industry's liquidated damages plan.

Anti-Friction Bearing: The code authority for the anti-friction bearing industry has made application for approval of a budget and basis of contribution for the period Jan. 1 to Dec. 31, 1935. Suggestions or objections must be submitted before March 28 to Deputy Administrator Dexter A. Tutein, City Club Building.

Non-Ferrous and Steel Convector: The code authority for the non-ferrous and steel convector industry has applied for approval of its \$2,315 budget and basis of contribution for the year 1935. The basis of contribution is 1/5 of 1 per cent of the dollar volume of business of each member of the industry.

Lightning Rod Manufacturing: The code authority for the lightning rod manufacturing industry has submitted for approval a proposed amendment to the code, providing for a budget system.

Complete Wire and Iron Fence: The code authority for the complete wire and iron fence industry, subdivision of the fabricated metal products manufacturing and metal finishing and metal coating industry, has submitted an application for approval of a proposed code amendment to clarify the definition of the supplementary industry.

Refrigeration Valves and Fittings: The supplementary code authority for the refrigeration valves and fittings manufacturing industry, subdivision of the fabricated metal products manufacturing and metal finishing and metal coating industry, has submitted proposed code amendments concerning alternates for members of the code authority, their method of election and manner of voting, together with proposed amendment relating to the code's system of price filing.

Vitreous Enamelled Ware: The code authority for the vitreous enameled ware industry, subdivision of the fabricated metal products manufacturing and metal finishing and metal coating industry, has submitted for approval a proposed amendment to the code, deleting rule A of Article V, carrying a mandatory below-cost sales prohibition.

Lead Industry: The code authority for the lead industry has submitted for NRA approval a proposed code amendment which would, "for reasons of shift change," permit employees "to work in excess of eight hr. but not more than 16 hr. in a 24-hr. period."

Metal Window: Public hearing on proposed amendments to the code for the metal window industry will be held March 26, at the Hamilton Hotel. The proposed amendments would exempt export sales from the code's marketing provisions, remove inter-company sales within the industry from certain marketing limitations, clarify the code definitions, and prohibit multiple bidding and splitting orders.

Steel Casting Code Clarified—Other Developments in Codification

WASHINGTON, March 19.—The NIRB has announced that a public hearing will be held April 2, in room 2062-64, Department of Commerce Building, on an interpretation by the code authority of Article II, section 3, of the code for the steel casting industry. Deputy Administrator Dexter A. Tutein will conduct the hearing.

The interpretation is as follows: "Steel castings (whether finished, semi-finished, or rough), when sold for use as repair or replacement parts for products of another industry already in use and sold in competition with similar castings produced by the other members of the steel casting industry, are subject to the code of fair competition for the steel casting industry, regardless of whether or not they are produced and/or sold by a company which is owned by or affiliated with another company producing and/or selling new products of another industry."

Malleable Iron: The NIRB has announced an extension of the trial period of the cost accounting system, a schedule of fair and reasonable costs, and procedure for making such schedule effective until modified or terminated by further order of the board. The trial period, originally granted April 25, 1934, for a period of 90 days, was extended three times, on July 31 and Nov. 12, 1934, and Jan. 11, 1935.

Construction Machinery Distributing: Suggestions or objections concerning a budget and basis of contribution proposed by the construction machinery distributing trade's code authority for the calendar year 1935 must be submitted before April 2 to Deputy Administrator F. A. Hecht. Barr

Building. The budget totals \$55,685. The basis of contribution is 0.3 per cent of gross sales for 1934. Voluntary contributions made before approval of the budget are to be credited to assessments.

Machine Tool and Equipment Distributing: The code authority for the machine tool and equipment distributing trade has applied for approval of an amendment providing that the supervisory agency of the trade shall submit to the board within 30 days after the enabling amendment a list of hazardous occupations in the trade, and granting recognition of compliance with the child labor prohibition if the employer secures proper state employment certificates.

File Manufacturing: The code authority for the file manufacturing industry has applied for approval of its \$16,000 budget and basis of contribution for the period from Dec. 1, 1934, to Nov. 31, 1935.

Steel Package Manufacturing: The code authority for the steel package manufacturing industry has applied for approval of a proposed amendment to rule A of Article V of the code, providing that no member of the industry shall sell or exchange, or offer to sell or exchange, any products of the industry for which prices and other conditions of sale have been filed by him pursuant to the provisions of this article, except in accordance with such prices and other conditions of sale.

Wiring Device: The NIRB has extended the stay of the last sentence of Article II, Section 2, of the code for the wiring device industry, subdivision of the electrical manufacturing industry, until April 12, 1935. The stay was originally granted for a period of 30 days from the inception of the code, Jan. 15. The sentence in question reads as follows: "Any person who imports outside the continental United States, for resale within the United States, any product of the subdivision shall be considered as one promoting the manufac-

Sales of Steel for Oil Well Derricks Clarified—Other Resolutions Revised

TRADE practice rules for the sale of bars, plates or shapes in carloads to be used for the fabrication of oil well derricks are laid down in Commercial Resolution No. A39, adopted by the directors of the American Iron and Steel Institute on March 14, and effective March 21. The resolution provides that such steel may be billed to the freight station nearest to the place of erection of such derrick, or, if the structure is not to be erected immediately, the material may be billed to the freight station nearest to the buyer's warehouse.

It is ruled, however, that if fabrication-in-transit freight rates are to be taken advantage of, such sales must conform in every way with the provision of Regulations No. 9. If the material to be used requires galvanizing, and fabrication-in-transit privileges do not apply, the place of delivery shall be deemed to be the freight station nearest to the point of fabrication.

The resolution further provides that sales of plates, shapes and bars for oil derrick fabrication shall not be subject to Resolution A5, which covers sales of steel for identified structures.

Commercial Resolution A40 provides that the maximum period of free credit allowed on shipments of steel products to Government divisions shall begin upon delivery of such products to the buyer or, if inspection is required, upon delivery after inspection to the carrier transporting such material to destination.

Resolution A10 relating to agency agreements has been amended and now requires that all such agreements previously made must be filed with the secretary of the institute before April 1. All subsequent agreements must be submitted to the code authority for approval, and violations are subject to the usual \$10 a ton fine.

Resolution A14 has been strengthened by subjecting violators of conversion agreement contracts to the usual liquidated damages provided for in the code.

The reconsignment of code products shipped to a customer is further clarified by the amending of Resolution A15. More complete records of the ultimate disposition of purchases to be later reconsigned are called for and all members of the code are required to

furnish any possible information on the subject asked for by the secretary of the institute.

The definition of a jobber of tubular products, as outlined in Regulations No. 7, has been extended to include the United States Government and any State or municipality or any department or agency of any thereof.

Weirton Worker Held Two High "Records"

WASHINGTON, March 19.—Mel Moore, "rank and filer" of the Amalgamated Association of Iron, Steel and Tin Workers, made two records as a sheet mill roller at the Steubenville, Ohio, plant of the Weirton Steel Co. Hearing on his complaint of discharge for

Steel Workers Earn 6000 Lb. of Silver Dollars

THE Gulf States Steel Co. recently paid the employees at its Gadsden, Ala., plant entirely in silver dollars—6000 lb. of them, the idea being to impress the city with the size of the semi-monthly payroll and also to ascertain how the workers spend their money.

The workers carried away their money in paper sacks, fruit jars, socks, hats, anything that would hold the cartwheels. Forthwith it was distributed among the merchants who cooperated with the Chamber of Commerce and made a report as to just what percentage of their sales were paid in silver dollars.

"It took 20 paymasters three hours to pay off the 3000 employes," said L. E. Gohegan, vice-president and general manager of the company, "but everybody had lots of fun, the plant advertised its contribution to the community and we learned just how the employees spend their money."

union activities, held yesterday before Admiral Wiley of the National Steel Labor Relations Board, brought out the fact that in 1933 and 1934 Mr. Moore produced the smallest finished tonnage and the largest scrap tonnage of any roller in the mill. He also was shown to have been the outstanding absentee from work by a large margin.

His record as the poorest producer of finished material applied not only to his total tonnage but also to average tonnage per turn. His record of absence, occasioned most of the time by his union activities, was extremely high. In 1934 he was absent 36 turns while the total absence of the four rollers at his mill was 45 turns. Moore charged that he was given cold and rough metal to work with, a fact which was denied by witnesses for the company, including Thomas P. Caine, manager, and B. Shrake, sheet mill superintendent. Both said there could have been no possible arrangement of the mill schedule to discriminate against a roller in selection of metal but that it was handled as orders came in.

It was also denied that Moore was given the more difficult light gage tonnage to roll to a greater degree than any other roller. Earl Reed, counsel for the company, also pointed out that the light gage material pays a high wage rate, so that it could not be charged that this would involve discrimination, even if Mr. Moore's charge as to amount of handling light gage tonnage were true. T. E. Millsop, vice-president of the company, said it never discharged an employee because of his affiliation with any labor organization. On the contrary, he said, the company has standing instructions to its mill managers to disregard any employee's labor affiliation and that the only requirement was that the worker perform his job satisfactorily.

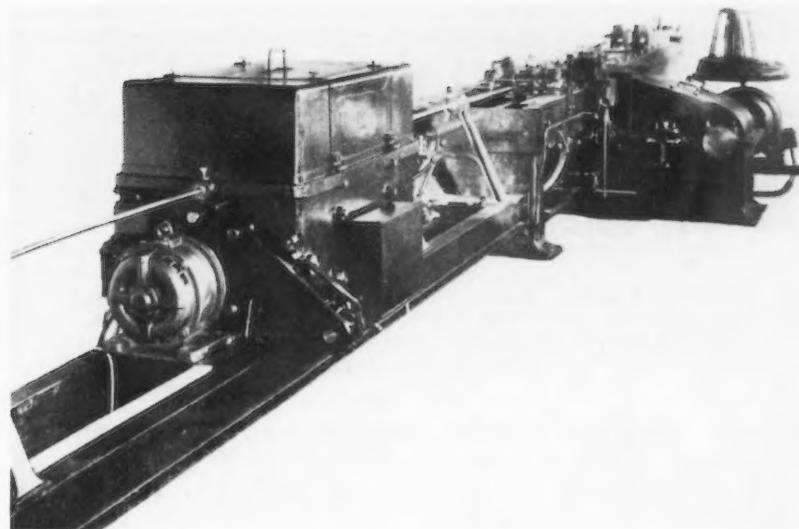
Mr. Moore admitted he was often absent without getting permission from the superintendent of the mills, as required by company rules. Moreover, he did not deny that occasionally he would report that he would be gone only a day or so while actually he would be absent for two weeks, as he was during the 1934 convention of the Amalgamated association in Pittsburgh. Despite his violation of the rules and his frequent absences, he was continued on the company's payrolls. Mr. Moore likewise, in reply to a question by Mr. Reed, admitted that at meetings of the Amalgamated lodge in Steubenville he had called high officials of the company vile names.

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Machine for Straightening and Polishing Wire Rods

A NEW, patented combination machine, for the manufacture of drill rods, screw machine rods, etc., of $\frac{1}{8}$ - $\frac{5}{8}$ in. diameter, has been brought out by the engineering firm of Schumag, Aachen, Germany, and is offered by W. A. Schuyler, Fisk Building, New York. Steel coils coming directly from the rolling mill, or brass coils coming directly from the extrusion press, are converted by this machine in a single operation and with one operator into straight and polished rods.

The machine does preliminary straightening of the coil material, drawing or reducing to size, cutting to length, and straightening and reeling or polishing. The entire process is automatic, and the material flows through the machine continuously.

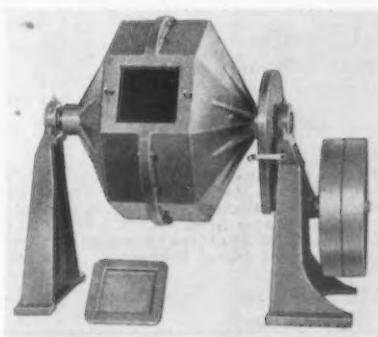
The makers of the machine claim that it offers great economies in the manufacture of rods, and that the finished rods are perfectly straight and highly polished. Also, because the material moves uninterruptedly forward in a straight line, no disturbing inside stresses or knots occur in the rod. The grippers, which pull the material through the adjustable die, do not leave any marks on the surface of the rod.

The straightening and reeling unit can be furnished separately, when it is used for straightening and polishing pre-cut rods or tubes of any length. The rod or tube, which is pushed into the machine, rotates rapidly between two pairs of reeling discs and at the same

time gets straightened by passing through three offset bushings mounted on ball bearings. When the rod or tube leaves the machine, it is perfectly straight and highly polished. In the separate straightening and reeling machine different rates of speed and, therefore, different polishes are obtained. It is claimed that the reeling operation improves the surface of the rod and eliminates irregularities, without changing the diameter of the rod. This machine is furnished in two sizes for $\frac{1}{8}$ - $\frac{1}{4}$ -in. diameter rods or tubes.

Tumbling Barrel Has Triple-Action Feature

DESIGNED to provide a triple action in tumbling, pulverizing and mixing operations, the 10-cu. ft. capacity tumbling barrel shown below is being marketed by the



Hartford Steel Ball Co., Hartford, Conn.

A rapid, flowing motion is said to be imparted to the barrel contents. Roller bearing chain drive, inclosed and running in oil, is employed. Floor space required is 36 in. x 68 in. x 48 in. high. Clearance under barrel is 16 in. Shipping weight is approximately 1450 lb.

Financial Notes

The Ludlum Steel Co., Watervliet, N. Y., had 1934 net profit after all charges of \$442,348. After dividends on preferred stock, balance carried to surplus amounted to \$113,029.

The Crucible Steel Co. of America, New York, had net profits after all charges in 1934 of \$75,157, compared with a net loss of \$354,750 in the preceding year. In the first half of the year, with operations averaging 72.22 per cent of capacity, a profit of \$712,034 was shown, but in the last half, with operations at only 35.11 per cent, a net loss of \$636,878 was encountered. With 1929 sales considered as 100 per cent, 1934 business was equivalent to 52.85 per cent, compared with 37.49 per cent in 1933 and a low of 23.42 per cent in 1932.

The American Smelting & Refining Co., New York, had net income after all charges in 1934 of \$7,583,202, compared with \$6,010,384 in 1933.

Eastern Rolling Mill Co., Baltimore, had 1934 net loss of \$347,153, compared with a loss of \$277,976 in 1933.

Laclede Steel Co., St. Louis, had net profit in 1934 after all charges of \$104,012, compared with a net loss of \$40,483 in the preceding year.

Black & Decker Mfg. Co., Towson, Md., declared a regular current quarterly dividend of 2 per cent or 50 cents a share, on the preferred stock. This will be the first dividend to be paid by the company since June 30, 1931, preferred dividends aggregating \$7 per share having accumulated since that date.

The International Nickel Co. of Canada, Ltd., in the year ended Dec. 31, 1934, had net profit of \$18,487,479, after all charges including provision of \$5,821,132 for depreciation, mine depletion and other reserves. After disbursement of \$1,933,899 in preferred dividends, there remained \$16,553,580, equal to \$1.13 per share on the common stock. This compares with 53c. per share in 1933 and with a net loss of \$135,345 in 1932.

United Chromium, Inc., New York, has removed its Detroit offices and laboratory to 2751 East Jefferson Avenue.

Stewart-Warner Corp., Chicago, in 1934 had consolidated net income after all charges of \$571,968, equivalent to 46c. a share on common stock. Consolidated net sales were \$17,075,344, as compared with \$9,920,226 in 1933, an increase of 72.1 per cent.

Monthly Report of Metal Working Activity

These Data Are Assembled By THE IRON AGE From Recognized Sources And Are Changed Regularly As More Recent Figures Are Made Available. Boldface Type Indicates Changes This Week

	February, 1935	January, 1935	February, 1934	Two Months, 1935	Two Months, 1934
Raw Materials:					
Lake ore consumption (gross tons) ^a	2,467,269	2,280,393	1,727,746	4,747,662	3,338,149
Coke production (net tons) ^b	2,889,552	2,622,594	.....	.....	5,206,279
Pig Iron:					
Pig iron output—monthly (gross tons) ^c	1,608,552	1,477,336	1,263,673	3,085,888	2,478,899
Pig iron output—daily (gross tons) ^c	57,448	47,656	45,131	52,303	42,016
Castings:					
Malleable castings—production (net tons) ^d.....	.....	43,400	33,939	.....	64,356
Malleable castings—orders (net tons) ^d.....	.....	44,568	36,594	.....	69,095
Steel castings—production (net tons) ^d.....	.....	.....	28,526	.....	56,170
Steel castings—orders (net tons) ^d.....	.....	.....	35,698	.....	61,974
Steel Ingots:					
Steel ingot production—monthly (gross tons) ^e ..	2,742,125	2,834,170	2,182,826	5,576,295	4,154,247
Steel ingot production—daily (gross tons) ^e ..	114,255	104,969	90,951	109,339	81,456
Steel ingot production—per cent of capacity ^e ..	51.61	47.67	41.31	49.66	36.99
Employment in Steel Industry:					
Total employees ^f.....	.....	407,071	403,298	.....	398,155
Total payrolls (thousands of dollars) ^f.....	.....	44,328	35,425	.....	35,151
Average hours worked per week ^f.....	.....	33.6	33.1	.....	31.6
Finished Steel:					
Trackwork shipments (net tons) ^g	2,892	2,333	3,310	5,225	6,121
Sheet steel sales—(net tons) ^g.....	.....	321,831	184,355	.....	393,818
Sheet steel production (net tons) ^g.....	.....	235,714	194,830	.....	358,452
Fabricated shape orders (net tons) ^g.....	.....	55,857	75,294	.....	166,888
Fabricated shape shipments (net tons) ^g.....	.....	85,950	47,509	.....	125,132
Fabricated plate orders (net tons) ^g.....	.....	18,778	14,641	.....	30,538
Reinforcing bar awards (net tons) ^g	22,265	15,600	17,625	37,865	35,425
U. S. Steel Corp. shipments (tons) ^h	583,137	534,055	385,500	1,117,292	717,277
Ohio River Steel Shipments ^{hh}.....	.....	52,656	4,373	.....	58,142
Fabricated Products:					
Automobile production U. S. and Canada ^{dd}	*355,350	303,372	240,278	*658,722	404,089
Construction contracts (37 Eastern States) ⁱ	\$75,083,500	\$99,773,900	\$96,716,300	\$174,857,400	\$283,180,000
Steel barrel shipments (number) ^j.....	.....	437,442	572,915	.....	1,279,262
Steel furniture shipments ^j.....	.....	\$1,139,497	\$894,076	.....	\$1,890,914
Steel boiler orders (sq. ft.) ^j.....	.....	391,784	227,093	.....	462,869
Locomotive orders (number) ^k	1	0	20	1	20
Freight car orders (number) ^k	806	24	20,227	830	20,377
Machine tool index ^l	53.0	65.5	50.9	†61.5	†58.2
Foreign Trade:					
Imports of pig iron (gross tons) ^m.....	.....	2,033	10,777	.....	22,663
Imports of rolled steel (gross tons) ^m.....	.....	14,180	6,456	.....	13,639
Exports of all rolled steel and iron (gross tons) ^m..	.....	69,491	74,968	.....	165,393
Exports, finished steel (gross tons) ^m.....	.....	66,523	68,722	.....	147,540
Exports of scrap (gross tons) ^m.....	.....	186,112	75,884	.....	163,156
British Production:					
British pig iron production (gross tons) ⁿ	483,100	521,200	414,400	1,004,300	855,700
British steel ingot production (gross tons) ⁿ	769,500	757,800	707,500	1,527,300	1,542,000
Non-Ferrous:					
Lead production (net tons) ^o.....	.....	30,674	34,349	.....	72,919
Lead shipments (net tons) ^o.....	.....	34,164	25,778	.....	59,689
Zinc production (net tons) ^p	33,072	35,614	30,296	68,686	63,373
Zinc shipments (net tons) ^p	34,903	35,538	32,485	70,441	59,141
Deliveries of tin (gross tons) ^r	3,905	4,600	2,940	8,505	6,250

* Preliminary. † Three Months' Average.

Sources of figures: ^a Lake Superior Iron Ore Association; ^b Bureau of Mines; ^c THE IRON AGE; ^d Bureau of the Census; ^{dd} When preliminary, from Automobile Manufacturers' Association—Final figures from Bureau of the Census; ^e American Iron and Steel Institute; ^f National Association of Flat-Rolled Steel Manufacturers; ^g American Institute of Steel Construction; ^h United States Steel Corp.; ^{hh} U. S. Engineer, Pittsburgh; ⁱ F. W. Dodge Corp.; ^j Railway Age; ^k National Machine Tool Builders Association; ^m Department of Commerce; ⁿ British Iron and Steel Federation; ^o American Bureau of Metal Statistics; ^p American Zinc Institute, Inc.; ^r New York Commodity Exchange.

SUMMARY OF THIS WEEK'S BUSINESS

Basing Point Reports Accentuate Caution of Steel Buyers

Ingot Rate Recedes to 47 Per Cent and Scrap Composite Falls To \$10.83—Tin Plate Output Rises to 85 Per Cent of Capacity

STEEL demand is still receding and ingot output has fallen from 47½ to 47 per cent, while scrap, as measured by THE IRON AGE composite price, has dropped from \$11.17 to \$10.83 a ton. Whether the decline in business reflects an actual reduction in consumption or merely mirrors the growing conservatism of buyers cannot be answered definitely at the present juncture. Without doubt a spirit of caution, when it becomes pronounced enough, affects consumption as well as the volume of buying. Thus far the automobile industry, premier steel consumer, has not pared down its ambitious production programs for March and April, but it is increasingly apprehensive that retail demand will react unfavorably to the numerous political and industrial disturbances of the day.

Most disconcerting of recent developments was the reentry of the basing point issue into the national political arena. While the report of the National Recovery Administration on this subject is regarded as much sounder and fairer than that of the Federal Trade Commission, it is feared that adoption of the recommendations of either body at this time would result in far-reaching dislocations in both business and employment. Pending the settlement of this issue, as well as the fate of the steel code, close buying will be the rule and forward undertakings will be discouraged.

The threat of a bituminous coal strike on April 1 is also a disturbing element in the market situation, though fuel accumulations are believed to be sufficient to carry the steel industry for a moderate period.

DESPITE the general downward tendency of steel demand, tin plate output has advanced from 75 to 85 per cent of capacity. Present schedules are based almost entirely on actual releases, though some of the material will be shipped at a later date. A large part of the movement is for stocking at packing centers, but there is also a strong demand from general line can makers.

Sheet mill output has dropped five points to about 70 per cent of capacity as a result of smaller automotive releases, but mills look for an early rebound in demand from the motor car industry, relying particularly on the expected placing of delayed requirements by two large manufacturers.

Spring demand for wire products from the agricultural sections of the country is slow in making headway. Dust storms are again menacing a number of Western States and spring rains have been light in other areas. Nevertheless, farm implement production continues to improve except where operations are crippled by strikes.

AWARDS of constructional steel are heavy. Lettings of structural steel, at 45,800 tons, are the largest since the first week in May, 1933. Included are 33,000 tons for the Triborough bridge, New York, and 4250 tons for transmission towers for the Norris dam in Alabama. Concrete bar awards of 7800 tons include 3580 tons for the Moffatt tunnel in Colorado.

The Chicago & North Western has entered the market for 25,000 tons of rails and 6000 tons of track supplies. The New York Central has supplemented its recent rail order with purchases of 9500 tons of track accessories. The Pere Marquette will buy steel for car repairs and other Western roads are giving more serious attention to equipment repair programs.

INCREASED pipe production and the starting up of a new strip mill have raised ingot output in the Valleys from 51 to 55 per cent. Elsewhere operations are unchanged or declining. The ingot rate is off two points to 35 per cent at Pittsburgh, three and one-half points to 47½ per cent at Chicago, one point to 33 per cent in the Philadelphia district, three points to 58 per cent in the Cleveland-Lorain area, six points to 32 per cent at Buffalo, four points to 50 per cent in the South and 12 points to 83 per cent at Detroit.

Steel fabricators have protested to the NRA against proposed quantity extras on plates and shapes, contending that they would increase costs up to \$8 a ton.

March automobile production is expected to approximate 415,000 units, and the April total is expected to rise at least to 435,000, but the motor car industry will hazard no predictions for May or June.

THE IRON AGE composites for pig iron and finished steel are unchanged at \$17.90 a ton and 2.124c. a lb. respectively.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Mar. 19	Mar. 12	Feb. 19	Mar. 20,
Per Gross Ton:	1935	1935	1935	1934
No. 2 fdy., Philadelphia	\$20.26	\$20.26	\$20.26	\$19.26
No. 2, Valley furnace	18.50	18.50	18.50	17.50
No. 2 Southern, Cin'ti.	19.13	19.13	19.13	18.13
No. 2, Birmingham†	14.50	14.50	14.50	13.50
No. 2 foundry, Chicago*	18.50	18.50	18.50	17.50
Basic, del'd eastern Pa.	19.76	19.76	19.76	18.76
Basic, Valley furnace	18.00	18.00	18.00	17.00
Valley Bessemer, del'd P'gh.	20.76	20.76	20.76	19.76
Malleable, Chicago*	18.50	18.50	18.50	17.50
Malleable, Valley	18.50	18.50	18.50	17.50
L. S. Charcoal, Chicago	24.04	24.04	24.04	23.54
Ferromanganese, seab'd car-lots	85.00	85.00	85.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2
Light rails, Pittsburgh	35.00	35.00	35.00	32.00
Rerolling billets, Pittsburgh	27.00	27.00	27.00	26.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	26.00
Slabs, Pittsburgh	27.00	27.00	27.00	26.00
Forging billets, Pittsburgh	32.00	32.00	32.00	31.00
Wire rods, Pittsburgh	38.00	38.00	38.00	36.00
Cents	Cents	Cents	Cents	
Skelp, grvd. steel, P'gh, lb.	1.70	1.70	1.70	1.60

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.80	1.80	1.80	1.75
Bars, Chicago	1.85	1.85	1.85	1.80
Bars, Cleveland	1.85	1.85	1.85	1.80
Bars, New York	2.13	2.13	2.13	2.08
Plates, Pittsburgh	1.80	1.80	1.80	1.70
Plates, Chicago	1.85	1.85	1.85	1.75
Plates, New York	2.08	2.08	2.08	1.98
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.70
Structural shapes, Chicago	1.85	1.85	1.85	1.75
Structural shapes, New York	2.05 1/4	2.05 1/4	2.05 1/4	1.95 1/4
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	1.75
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.40

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables. †Blue Eagle copper.

The Iron Age Composite Prices

Finished Steel

March 19, 1935	2.124c. a Lb.
One week ago	2.124c.
One month ago	2.124c.
One year ago	2.008c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

Pig Iron

\$17.90 a Gross Ton
17.90
17.90
16.90

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap

\$10.83 a Gross Ton
11.17
11.92
12.67

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	LOW	HIGH	LOW	HIGH	LOW
1935	2.124c., Jan. 8	2.124c., Jan. 8	\$17.90, Jan. 8	\$17.90, Jan. 8	\$12.33, Jan. 8	\$10.83, Mar. 19
1934	2.190c., April 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.42, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Pittsburgh Rate Is Off Two Points to 35 Per Cent

Mar. 20,
1934
Cents
2.25
2.35
2.85
2.95
1.75
1.85
2.35
2.40
2.20
2.25
2.85
2.90
\$5.25

14.25
11.75
12.00
11.75
13.00
13.75
13.25
9.50
11.00
9.50

\$3.50
4.25

Cents
7.75
8.00
54.25
4.37 1/2
4.72 1/2
3.90
4.00
7.65

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Ton

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Sept. 25
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Valley Output Advances to 55 Per Cent and Wheeling Holds at 85—Tin Plate Production Up—Industry Well Prepared for Coal Strike

PITTSBURGH, March 19.—Raw steel production in the Pittsburgh district has sagged two points this week to 35 per cent of capacity after a sustained rate for three consecutive weeks. Increased pipe production and the engagement of new strip mill capacity in the Valleys and nearby northern Ohio mills have sent up production four points to about 55 per cent. Mills in the Wheeling district are holding output at a strong 85 per cent.

The likelihood of a general slump after the close of first quarter has appeared more certain since the recent Washington controversy over the basing point system for steel prices. Although the effect of bureau reports on the steel code has not immediately been reflected in the steel market, consumers will likely resort to a waiting game until the question of future methods for pricing steel products is settled.

Those units in the Pittsburgh district supplying automobile steel and tin plate are showing resistance for the time being to the down trend in other steel departments. In fact, tin plate production this week has soared 10 points to about 85 per cent of capacity, which is believed to be near the highest point at which the country's capacity can practically be operated.

Owing to less insistent automotive orders, sheet mill output has declined five points to about 70 per cent, but the drop appears temporarily checked by an encouraging volume of miscellaneous orders. Structural and reinforcing steel inquiries have not yet reflected an expected seasonal upturn in constructional lines, nor has demand for railroad steel yet indicated a measurable expansion in track laying and maintenance at this season.

Despite the imminence of the expiration of the miners' wage agreement on April 1 and the union's threat to suspend bituminous coal operations, little anxiety is being displayed by steel producers in the

Pittsburgh and Valley districts. Accumulations of industrial fuels are believed to be sufficient to carry current operations for a moderate period. It is evident, however, that heavy stocking of fuel continues.

Possibly barometric of the early trend in the steel industry is a further weakness in scrap prices.

Pig Iron

Second quarter contracting has not developed significantly thus far, nor has spot buying been encouraging. Foundry melt in this district is sporadic, and pig iron consumers are not inclined to lay in stocks beyond early actual needs. Steel mill equipment makers perhaps are accounting for the largest proportion of the district's melt, but merchant stacks are not participating heavily in such business, which is usually ruled by reciprocal arrangements.

Semi-Finished Steel

Movement of sheet bars and skelp comprises the lion's share of activity in this market. Non-integrated mills are not generally specifying beyond early April, and backlog tonnage of semi-finished grades is meager. Detached tin plate and sheet mills are practically the only units interested in forward requirements. An early fillip to semi-finished grades benefiting indirectly from the automotive industry is expected in late March or early April.

Bolts, Nuts and Rivets

Bookings by most producers in March are on a parity with February orders. The expected heavier specifications against low-priced first quarter contracts have not yet developed, but some increases are believed certain before the close of the contract period on March 31. Current business is unusually general in character.

Rails and Track Accessories

The New York Central Railroad has distributed orders for approximately 9500 tons of track accessories in conjunction with its award of about 23,000 tons of rails. Producers in the Tri-State district participated in the fastenings tonnage, while the rail tonnage went to other districts. If construction plans for dams in the Muskingum watershed control project in Ohio are carried out, the relocating of approximately six miles of main track and side track on the Baltimore & Ohio Railroad lines will be necessary. Rail and track accessory needs for this work are indefinite.

reinforcing steel

The Baltimore & Ohio Railroad will require about 4000 tons of reinforcing steel for grade crossing elimination on Staten Island, N. Y. Bids will be taken at Zanesville, Ohio, on additional dam construction for the Muskingum watershed control project in Ohio. The usual spring pickup in road work, building construction and other lines awaiting open weather still lacks definite promise of bringing a great deal of reinforcing tonnage to producers this year. The greatest uncertainty lies in the pending huge Federal relief bill, which, if passed, will also shape the road building programs of many States.

Cold-Finished Bars

Specifications are holding to February levels. Although orders from motor car centers are less pressing, there is still a general belief that inventories in the automobile industry will soon face imperative replenishment on a large scale. Interest from general consuming lines is showing up rather well. The movement of cold-finished material to the farm implement industry is well sustained. Warehouse stocking still is on a restricted basis.

Plates and Shapes

Occasional inquiries for single river bottoms are appearing, but plate requirements for such craft usually are unimportant. Plate mills in this district are existing on a meager fare of miscellaneous business, including the quarterly placement of carriers. A fair tonnage of plates is now being figured for railroad second quarter needs.

Structural awards are running ahead of inquiries. Formal contract for 8000 tons for a parcel post building at Boston has been finally awarded to American Bridge Co. About 1400 tons for a Long Island Railroad grade crossing elimination will be rolled by the Jones & Laughlin Steel Corp. The only important inquiry reported in this district is for 2500 tons for a

post office and court house building at San Antonio, Tex.

Tubular Products

Seasonal betterment in general pipe demand is not evident. A slight improvement is reported in bookings of standard pipe, but aggregate tonnage of oil country goods has not yet turned definitely upward. April is expected to usher in a more definite expanding demand. Orders for smaller diameter tubing, including mechanical tubing and seamless commercial boiler tubes and locomotive boiler tubes, are in small volume.

Bars

Shipments to the automotive industry are not so urgent at the moment, but early buying in preparation for heavy second quarter assembly schedules is in prospect. The delayed requirements of at least two large motor car makers are relied upon heavily by steel mills in the immediate outlook. Miscellaneous demand is not noticeably diminishing, although interest is more generally restricted to spot needs.

Wire

Demand for wire products is irregular, with consumers specifying only in keeping with early requirements. A fair movement of manufacturers' wire continues, the bulk going to the automotive industry, while jobbers are appearing in the market chiefly to piece out stocks. Calls for wire fencing are increasing as spring activity gets under way. A fairly substantial potential demand for wire mesh for road construction is in the making, but such prospects depend almost entirely upon disposition of pending Federal legislation.

Sheets

Miscellaneous consumers have temporarily displaced the automotive industry in current demand for sheets. In the past week specifications from motor car centers were unusually limited, while orders from various other industries, including farm implement, refrigerator, barrel and electrical goods, were in encouraging volume. A small pickup in demand for galvanized sheets is reported, but this grade has not yet displayed the usual vigor attending the spring.

Although the volume of demand appears to be diminishing, sheet production has not yet suffered seriously. In the current week operations for the sheet industry probably will average slightly lower at about 70 per cent. Most mills are comfortably booked until March 31, while some mills are booked at capacity on cold-reduced items. May sheet requirements have scarcely been touched.

Tin Plate

With only scattered exceptions, tin plate producers will operate at virtual capacity this week. Output for the industry has jumped about ten points to 85 per cent of capacity, thus placing current output at a peak for this season. Present schedules are based almost entirely upon actual releases, but some material will be shipped at a later date. A large part of the movement is for stocking at packing centers, although a strong demand exists for general line can manufacture.

Strip Steel

The automotive industry appeared more frequently in this market in the past week than in the preceding period, but aggregate volume of buying was not significant. Most orders represented fill-in lots and failed to suggest that the expected renewal of large-scale covering had gotten under way. Not a great deal of tonnage from any source has been entered for shipment later than mid-April, while May bookings are extremely few. The trend in production continues slightly downward, with output this week scheduled at around 55 per cent.

Coke and Coal

With a suspension in bituminous coal production on April 1 considered as inevitable unless union leaders recede from present wage demands, movement of soft coal and beehive coke continues to be heavy. Most classes of consumers have been stocking to meet the possible contingency next month, but only a small dent in available fuel supplies above ground has been made by such movement. Slack is particularly plentiful after the heavy accumulations from screening for domestic sizes during the winter. A fair movement of slack is now in progress from this district to the Lakes, and also from Southern producing fields. Coke prices are fairly steady, while bituminous coal quotations are irregular despite the code.

Scrap

Declining steel mill activity and the beclouded forward outlook for general business have adversely influenced the scrap market. Although prices are only moderately lower, with declines averaging 25c. a ton below last week's quotations, market sentiment is extremely depressed. There is no pressure on the part of large brokers for lower quotations, as most short orders are practically completed. Mills, moreover, are not anxious to cover ahead except for bare needs and to maintain protective inventories. No. 1 heavy melting steel on the

recent Pennsylvania Railroad list is reported to have been sold at slightly above \$12.50, delivered Pittsburgh district. In a declining market the usual premium for railroad steel over ordinary material is not so generally observed, and selected railroad scrap at current quotations is not an inducement to buyers. Railroad specialties are well sustained. An apparent scarcity is serving to sustain the price for low phosphorus billet crops.

Coast Mill Output Declining

SAN FRANCISCO, March 18.—Instead of the anticipated up-swing in construction, the last few weeks have seen a lessening of activity on the Pacific Coast. With the greater part of the contemplated projects dependent on PWA loans and grants, business no longer seems to follow the natural seasonal trends. The placing of several major projects made for abnormal activity toward the end of 1934 and early this year.

Few bookings of note are reported. Columbia Steel Co. took 916 tons of steel sheet piling and 225 tons of structural steel for State highway construction in Ventura County, Cal. Western Pipe & Steel Co. will furnish approximately 1300 tons of plates to the general contractor on the Hetch Hetchy pipe line over San Francisco Bay. For the Green River pipe line, Tacoma, Wash., the general contractor has purchased 842 tons of No. 10 gage sheets and 127 tons of hot-rolled rods from the Columbia Steel Co. and 1200 tons of hot-rolled rods from the Pacific Coast Steel Corp.

The Colorado mill has been awarded 3580 tons of reinforcing bars required for lining Moffatt tunnel near Denver, Colo. Pacific Car & Foundry Co. is low bidder for furnishing 380 tons of structural steel for a ship emergency dock on the Bonneville project in Oregon.

The Fort Peck, Mont., spillway gate and cutoff structures, requiring 16,110 tons of steel, are outstanding among the projects pending. At Phoenix, Ariz., a general contract has been awarded on the Maricopa irrigation project, and the district will take bids soon on the material, including 1400 tons of structural steel, 1052 tons of rails and 485 tons of reinforcing bars. Dates for bids on two San Francisco Trans-Bay bridge contracts should be set within the next two weeks. Approximately 1750 tons of reinforcing bars will be used in the work.

Further Slump in Production In Chicago District



Ingot Rate Falls Three and One-Half Points to 47½ Per Cent—Contracting Is Light—Dust Storms Threaten Farm Demand

CHICAGO, March 19.—Actual ingot output has dropped three and one-half points to 47½ per cent of capacity. However, this is not an accurate measurement of the rate at which steel is moving from mills for the reason that no steel is being put on the bank and one mill, having acquired a sizable stock of ingots, reduced open-hearth operations and is eating into its ingot stock to meet part of current shipments of finished steel.

An encouraging situation is that both sales and specifications have rebounded, the totals for the past week being the third best of the year. Both totals include some rail tonnage which is not taking a minor role in this market.

The greatest disappointment to sellers lies in the direction of second quarter contracting, which is very light, and there is no promise now that it will come to life in any marked degree. The spring trade in wire and wire products is making some headway, but here again the volume to date is disappointing. Dust storms are again menacing the Western Prairie States and spring rains are none too plentiful in many large areas west and south of the Missouri River. Nevertheless farm implement manufacturers are forging ahead except where operations are crippled by strikes, such as the one now in force at the Case plant at Racine, Wis.

Pig Iron

March shipments show a moderate gain over the February rate, and sales are continuing on the basis of immediate needs. Sellers, anxious to avoid a peak, which experience has taught them must be followed by a valley, are not pressing for shipping instructions. They prefer to hold an even keel.

Reinforcing Bars

Awards remain sluggish in view of the tonnages on which figures have been entered. Turmoil at Washington regarding the future of NRA is undoubtedly a prime factor in holding back order signatures. Some scattered road tonnage has been placed but the bulk

of the winter's accumulation is being withheld from shop books. Floods on the Mississippi River are causing serious damage to dam and lock work that is uncompleted, and several contractors are reported to have suffered serious losses. Bars have been ordered for the Goldblatt Department Store, Chicago. Prices remain firm, with buyers in most instances playing a waiting game.

Cast Iron Pipe

Releases against old orders are better, but are below sellers' expectations for the reason that rains and thawing ground are keeping most contractors' equipment out of active service. Evanston, Ill., has ordered 850 tons of 16-in. pipe. Other transactions are small but more numerous than heretofore.

Sheets

Hot mill schedules are holding steady at 70 per cent of capacity and bookings are of such size that the current rate can be sustained for at least 30 days. In the meantime there is a substantial flow of new business, which is for the most part for early consumption. Jobbers are adding some tonnage to stocks, and the roofing trade is still moderately active in the market.

Rails

The Chicago & North Western is preparing to purchase 25,000 tons of rails and about 6000 tons of track supplies. Among tonnages that are still pending are 10,000 tons for the Missouri Pacific and 2000 tons for the Kansas City Southern. All things considered, there is fair business in light rails, but track fastenings are lagging despite the fact that in most parts of the country track work can now go forward actively.

Bars

Both specifications and new buying of bar mill products are on a slightly higher level. Drifts as to lines of consumption are somewhat more mixed than a week ago. Some producers find needs of automobile manufacturers are lower, while

others report a steady movement. Here and there farm implement manufacturers are consuming more steel, but at Racine, Wis., a strike has shut down one of the largest units in the industry. The farm group, while as yet it has felt no direct results, nevertheless is giving close attention to the possible economic effects of dust storms in western Kansas and reports from other Western sections that late snows and spring rains are lacking.

Plates

With the exception of work to be done on the Mississippi River there is little life in the plate market except as can be measured by orders of carlot proportions. The Pere Marquette will purchase materials for car repairs and other Western railroads are studying like programs on a scale larger than heretofore considered. A round tonnage will go into the Alton, Ill., dam, and replacement tonnages may be necessary at other Mississippi River dams and locks that are taking severe punishment from floods that are now ravaging that valley.

Structural Material

Predominant in about 5500 tons of fresh inquiries are such public projects as transmission towers for the Norris and Wilson dams and State highway bridges in Texas, Missouri and Oklahoma. Awards total 3200 tons, of which 600 tons represents numerous small lettings of less than 50 tons each. Plans of the Alton, Ill., dam are being distributed to bidders.

Wire Products

Although the rate of March sales and specifications is ahead of the February rate, nevertheless there is lack of snap to the opening of spring trade and sellers are in doubt as to what they can expect in the next four to six weeks. Forward buying is somewhat improved, particularly among jobbers, who are accepting deliveries on fencing and nails in larger volume.

Scrap

A comparatively small tonnage of heavy melting steel has been taken by a local mill at \$10.50 a gross ton delivered. Prices for most other grades are nominal in the absence of consumer buying. What activity there is in this market is confined almost wholly to dealer and broker trades against old orders, which are growing thin. Current shipments to mills are coming almost wholly from railroads and industries, dealers so far preferring to hold accumulations.

Large Bridge Tonnage Awarded at New York



Tri-Borough Contract, Calling for 33,000 Tons, Placed with McClintic-Marshall Corp.—New York Central Awards Track Fastenings

NEW YORK, March 19.—The fabricating contract for the suspension spans and approach viaducts for the Tri-Borough bridge, New York, calling for 33,000 tons, has been placed with the McClintic-Marshall Corp. About 20,000 tons of structural work for this project remains to be let.

The New York Central has distributed orders for approximately 9000 tons of track fastenings to supplement its recent rail order, and has awarded 1100 tons of concrete bars for the West Side elevated highway, Manhattan. This road will take Clayton act bids later in the month on its miscellaneous steel requirements for the second quarter.

Railroad shops have become busier with the arrival of weather more favorable to car and locomotive repair work.

Steel demand in general continues to taper, though tin plate releases remain in good volume. The reports on the basing point system, together with the prevailing spirit of political uncertainty, have encouraged buyers to hold back their orders.

The steel code authority is considering the adoption of a regulation to be known as No. 10 which will cover the same field for concrete bars that Regulations No. 9 does for structural steel.

Competition from foreign steel is steadily growing sharper in this area. Imported bars are being laid down at 1.80c. to 1.85c. a lb., duty paid, this port. Jobbers handling foreign steel are making deep inroads into the business of their competitors handling domestic materials. It is charged that foreign steel is finding its way into PWA projects.

Pig Iron

Sales in this area reflect the general uncertainty with which founders regard the second quarter. Only 1100 tons of new business was placed last week, as compared with 2000 tons a week earlier and 5000 tons booked a fortnight ago. The fact that releases on old or-

ders are showing a tendency to fall off is an indication that either aggregate foundry melt or the industry's backlog has declined within recent weeks. Imports of iron in January were unusually light. Only 2000 tons of all grades came into the country in comparison with the 11,900 tons imported in January a year ago.

Reinforcing Steel

After many weeks of inactivity practically all of the tonnage projects in this area were placed with distributors during the past seven days. Inasmuch as little new business has appeared, sellers have not much to look forward to until highway construction becomes more active. The bar requirements of the New York Central track depression work at New York, totaling 1100 tons, have been distributed among Truscon Steel Co., Fireproof Products Co. and Joseph T. Ryerson & Son, Inc. The 750 tons for the Tri-borough bridge piers, New York, has been placed with Kalman Steel Corp. and Fireproof Products Co., and the former company will also furnish 650 tons for a sewage plant located at Coney Island, N. Y. The National Bridge Co. has been awarded 225 tons of bars for a railroad bridge at St. Albans, N. Y. The one new project which appeared during the week calls for 250 tons for a sewer in the Bronx, on which bids will close March 19.

Scrap

Even though the domestic market is currently as weak as it has been for many months, there is some semblance of stability in this immediate territory as the result of continued buying for old export accounts. Brokers are purchasing in light amounts alongside barge at New York and Brooklyn docks, but the center of activity is Jersey City. At all points No. 1 and No. 2 steels are bringing the equivalent of \$9 and \$7.50 respectively, alongside barge. The price on cupola cast at Jersey City for English delivery has been dropped, and general purchases of brake shoes for Japanese delivery are tapering off.

Some brokers are having difficulty getting dollars out of Italy in payment for scrap deliveries and this large outlet is currently somewhat disorganized. Neither England nor Poland is showing much interest in new commitments, and Japan is trying to press the market down. As a consequence, little or no fresh Japanese business was placed during the week.

Sizable Scrap Purchase At St. Louis

ST. LOUIS, March 19.—The purchase of approximately 4000 tons of heavy melting steel by a district melter for delivery over a period of 60 days is outstanding in the local scrap market, which continues weak as a result of a lack of buying by the mills in other centers. No. 1 heavy melting steel and No. 2 railroad wrought are 25c. a ton off, while railroad springs, steel car axles and No. 1 railroad wrought are 50c. lower.

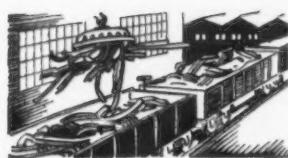
In addition to 6000 tons of structural steel, 1400 tons of reinforcing bars, and 230,000 sq. ft. of steel sheet piling, as previously noted, Dam No. 26 in the Mississippi at Alton will require 50 tons of corrosion-resisting steel, 40 tons of structural-nickel steel, 73 tons of cold-rolled steel, 240 tons of chromium steel, 86 tons of manganese steel, 350 tons of forged eye bars, 70 tons of regular carbon steel forgings, 187 tons of alloy steel forgings, 41 tons of steel grade 0 castings, 297 tons of steel grade 2 castings, 36 tons of alloy steel castings, 1890 ft. of 80-lb. rails for crane track, 129 tons of steel non-skid floor grating. Bids will be opened April 11 by the United States Engineer's office in St. Louis.

Bids were opened last night by the local Board of Education for the Southwest High School, which will require 480 tons of reinforcing bars. The State of Missouri will open bids on March 26 for highway bridges, calling for a total of 500 tons of structural steel. Oklahoma opened bids today for a bridge in Alfalfa County, requiring 719 tons of structural steel.

A pick-up in the movement of wire products, such as fencing and barbed wire, is reported. A fair amount of other finished iron and steel is selling.

Shipments of pig iron are continuing at the same rate as prevailed last month at this time. Implement manufacturers report business as good, and made some purchases of pig iron during the week.

Cleveland Rate Drops Three Points to 58 Per Cent



New Demand for Finished Steel Continues to Taper—Basing Point Reports Discourage Buying—Scrap Is Lower

CLEVELAND, March 19.—New demand for finished steel continues to tend downward. Ingot output in the Cleveland-Lorain territory this week declined three points to 58 per cent of capacity, one open-hearth furnace in Lorain going out. That operations are still well maintained is due largely to the backlog of orders from the automotive industry for March shipment. Finishing mill operations are being maintained at recent levels to get out this March tonnage. Automobile manufacturers are pretty well covered for their April requirements and little steel has been sold for May delivery.

The reopening of the basing point subject is expected to result in a further check in buying. A number of miscellaneous consumers of the heavier rolled steel products who have been accustomed to making contracts have placed contracts for the second quarter. Other consumers are showing no interest in contracts. Most consumers are ordering steel only in small lots as needed and ask for quick deliveries.

Sheets are the most active of all steel products, miscellaneous demand continuing good from manufacturers of refrigerators and other household equipment. Railroad business is limited mostly to miscellaneous orders for repair work.

The Wheeling & Lake Erie has increased to eight the number of switch engines it will build in its own shops and has placed most of the steel and parts for these locomotives.

Scrap has again declined and the market is inactive.

Pig Iron

Sales gained the past week, due largely to the placing of some sizable lots by automobile foundries. A leading Lake furnace interest sold 10,000 tons, or more than twice as much as during the previous week. Agricultural implement manufacturers are still or-

dering iron quite freely. Forward buying is rather limited, few consumers ordering more iron than they expect to melt within about 30 days. Shipments continue in excess of February.

Sheets

New demand from the automotive industry has tapered off. Motor car manufacturers appear to be well covered for their April requirements and, as they are no longer showing any anxiety over getting sheets as needed, they have placed very little tonnage for May shipment. Mills have enough business on their books to assure good operations through April, but are looking for some falling off in May. Miscellaneous demand, especially for enameling sheets, is being well maintained.

Strip Steel

Not much new business is coming from automobile manufacturers and mill backlog are being reduced. Specifications for hot-rolled strip from non-integrated cold rolling mills are holding up fairly well. Miscellaneous business is light.

Bolts, Nuts and Rivets

Sales and shipments this month are in about the same volume as in February. Demand from both the automotive and implement manufacturers is well sustained. Jobbers who have been out of the market since stocking up at the first of the year are again buying in a limited way.

Iron Ore

Consumption of Lake Superior ore in February was 2,467,269 tons, a gain of 186,876 tons over January. This compares with 1,727,746 tons consumed in February last year. Furnace stocks March 1 were 24,690,222 tons, and ore at furnaces and Lake Erie docks on that date amounted to 29,557,805 tons, as against 31,167,836 tons on the same date a year ago. Central district furnaces in February consumed 1,335,375 tons, an increase of 107,728 tons over

January. Lake front furnaces used 1,126,986 tons, a gain of 78,983 tons, and all-rail furnaces melted 4908 tons, an increase of 165 tons. Eastern furnaces, which consumed 5531 tons of Lake ore in February last year, have used no Lake ore this year. There were 83 furnaces using Lake ore in blast Feb. 28, an increase of two for the month.

Bars, Plates, and Shapes

Plans for considerable grade crossing elimination work have been prepared by railroads centering here, but are being held up awaiting action by the Government in appropriating funds for projects of this character. Little private construction work is coming out. Bids for a Cleveland housing project requiring 700 tons of reinforcing bars will be taken in Washington April 23. United States Engineers in Zanesville today opened bids for 1200 tons of steel piling and 700 tons of reinforcing bars in connection with the Muskingum district conservation project. Agricultural implement manufacturers are still ordering bars freely, both in billet and rail steel.

Scrap

Absence of new demand has resulted in a further weakening of prices, with declines of 50c. a ton on most grades. The most encouraging development is the release this week of considerably larger tonnages for shipment to the Valley district than these mills have been taking for the past two or three weeks. New demand from dealers is negligible, as these had previously bought considerable scrap for shipment against outstanding contracts.

Great Lakes Taking Bids on New Mill

DETROIT, March 19.—Great Lakes Steel Corp., Detroit, is now taking bids for the construction of a four-high continuous hot strip and cold reduction mill to be erected adjacent to its present mills at Ecorse, Mich. No decision regarding the details of the projected mill is expected for possibly 30 days, although it seems likely that the program will call for a 79-in. mill capable of rolling sheets 73 in. wide. Sheets wider than 73 in. can be rolled on present three-high mills at the Michigan Steel Division of the Great Lakes company. It is believed that construction will get under way soon enough for the new mill to be ready for operation early in 1936.

Steel Orders Still on a Parity with Shipments in the Youngstown Area

YOUNGSTOWN, March 18.—Finished steel orders reported by Valley producers are virtually on a parity with shipments. Backlogs in most instances, however, will be extremely small after March 31, the shipping deadline for first quarter tonnage, and mills will face the second quarter with rather indefinite prospects.

Demand for flat-rolled steel in the lighter finishes seems to be the only good omen for second quarter business at the moment. Some cold-rolled sheet and cold-rolled strip mills have booked enough tonnage until mid-April to assure full engagement. After that date, however, consumer requirements have thus far been specified stintingly. Shipments of sheets, strips and other items for automotive consumption are in satisfactory volume, though unquestionably lower than in February. Valley producers are quite sanguine that a substantial amount of steel buying by the motor car makers, for late April and May needs, is imminent. But this outlook is shaded somewhat by reports of lessening interest in the retail automobile trade.

Buying among other consuming groups is fairly well sustained. Sheet orders are being placed steadily for refrigerator and stove manufacture, while improved building activity is providing a better outlet for strip, as well as for sheets. Strip also is benefiting by a seasonal bulge in roller skate manufacture. Agricultural implement makers are still important in the movement of Valley steel.

Tin plate production in this district is well above 80 per cent. Most of the current activity is based on general line can specifications, and the seasonal peak in demand is yet in store. Winter conditions in most farm regions have been such as to portend favorable crops this year. Development of new consuming markets for cans also is adding slowly to tin plate rolling schedules.

With the exception of pipe production, which temporarily received a boost in this district when the Youngstown Sheet & Tube Co. booked approximately 13,000 tons of line pipe, the heavy hot-rolled steel departments are dragging down the general average operations. Structural mills are existing on the meager fare of slow public works projects, but expect to garner heavier orders when sea-

sonal construction activity appears. The railroads are not being considered as bright prospects for steel buying until earnings improve. Recent railroad orders booked here included a portion of the track accessories distributed by the New York Central.

The possibility of a 60-day suspension of bituminous coal operations has caused scarcely a ripple either among Valley steel producers or consumers. The large steel makers are reported to have ample fuel inventories to carry present operations for more than two months. The virtual breakdown in the bituminous coke prices also has brought a flood of offerings from producing areas not ordinarily serving the Valleys.

The scrap market, which has not entirely lost its recognition as a barometer of steel activity, is weak. Heavier industrial production and the greater seasonal flow of scrap from areas divorced from the Valleys during the winter months have largely contributed to the present lull. No. 1 heavy melting steel is procurable here at \$12 to \$12.50, with the lower figure more representative of the market. Turnings likewise are soft.

Valley steel producers have not yet reacted specifically to the Washington controversy over the basing system for steel prices. The general belief is that the establishment of group basing points would drastically restrict the scope of the Valley's present competitive territory.

Output in Further Dip at Buffalo

BUFFALO, March 19.—The Lackawanna plant of the Bethlehem Steel Corp. is operating eight open-hearth furnaces, Republic Steel Corp. is operating three, and Wickwire-Spencer Corp., one. It is reported that Wickwire-Spencer operations may soon be restored to two furnaces. The Seneca sheet division of Bethlehem is operating at 75 per cent.

Six hundred tons of steel to be fabricated for a new police headquarters building in Buffalo has been awarded to a local company. This was originally reported placed with another fabricator.

An Olean, N. Y., high school building will require 800 tons of

steel. Bids will be taken within a month or so. A new Federal office building in Buffalo will require 1000 tons, and 500 tons of steel will be needed for a New York Central grade crossing elimination job in Utica, N. Y.

Reports are current of a new scrap order placed by one of the local mills at \$11.25 for the No. 1 steel and \$10.25 for the No. 2, but this is unverified. Two lots of stove plate have been sold locally at \$9.25. One of the orders amounted to 500 tons. A large mill is offering \$10.50 and \$9 for No. 1 and No. 2 steel respectively.

Pig iron movement is at an unchanged rate, with a few sizable tonnages being placed from time to time.

One Open-Hearth Taken Off in South

BIRMINGHAM, March 19.—The steel market is settling down to a routine basis, now that current railroad tonnage has been largely placed, but operations continue steady, supported by backlogs. It was learned last week that the recent purchase of 5000 tons of rails by the Atlantic Coast Line increased the total known rail bookings of the Tennessee Coal, Iron & Railroad Co. to more than 70,000 tons.

Twelve open-hearth units were in production last week, as compared with 13 the preceding week. Schedules for the current week provide for 12 units. The Tennessee company is working five at Ensley and four at Fairfield. Gulf States Steel Co. is operating three at Alabama City.

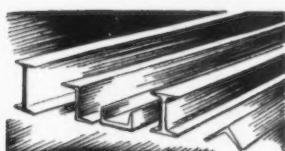
The merchant pig iron situation has remained unchanged for some time, with current bookings mostly on a spot basis. During the month there has been a fair-sized volume of second quarter tonnage placed, but this is just about in line with the present trend of consumption.

Nine blast furnaces are active, of which five are Tennessee company stacks.

March pipe shipments will be slightly larger than those of February, as a result of releases of orders placed from two to three months ago. New tonnage, however, will be less than that of last month.

Joseph T. Ryerson & Son, Inc., Chicago, is issuing volume No. 1 of the 1935 Ryerson stock list. The new S.A.E. specifications are included in the booklet.

Philadelphia Rate Declines One Point to 33 Per Cent



New Cuts Are Made in Foreign and Domestic Scrap Prices—Few New Building Projects

PHILADELPHIA, March 19.—Most sellers report a noticeable decline in fresh demand for all products, with sheets judged to be the most seriously affected commodity. The refusal of small consumers to purchase ahead is attributed to the general confusion regarding the future status of the steel code and, more specifically, to the possibility that the basing point system may undergo some revision.

Several of the district mills have reduced their open-hearth activity as the result of dwindling backlogs. The aggregate rate for the district is currently close to 33 per cent of potential capacity, a decline of one point from the level of a week ago. Bethlehem's Sparrows Point, Md., plant is still operating at a high level on spring wire, tin plate, and other flat-rolled products. The Pencoyd mill currently has four furnaces in operation and is rolling steel on its large structural unit.

The possibility that railroads of this district will buy in heavy quantities is today no more likely than it was several months ago. PWA-financed railroad construction and improvements are practically 90 per cent completed, and revenue freight car loadings in this area have shown a tendency to slip off during recent weeks. It is apparent, therefore, that car loadings must increase considerably before steel buying of any significance appears. The Pennsylvania Railroad opened a Clayton act list today covering its usual routine quarterly requirements. These requirements amount to about 5000 tons and include plates, shapes, bars, sheets, strip, billets, wheels and axles, spikes, tie plates, etc.

Pig Iron

Deliveries on old orders are holding at about an unchanged level. However, fresh business has shown a tendency to slacken, although the recession has not been pronounced. With the code under fire at Washington, local foundries are restricting purchases to immediate spot

needs even more religiously than was the case a month ago.

Sheets and Strip

Fresh business for sheets has dropped off 25 to 50 per cent, as compared with a fortnight ago. However, the pressure for deliveries on old contracts is unchanged, which indicates that local consumers are probably as active as a month ago. There is only a routine miscellaneous demand for blue-annealed material, but nearby plants are looking forward to a pick-up in the near future when small tank makers increase their output. The market for strip is very quiet.

Bars, Plates, and Shapes

Small private demand for structural steel is more noticeable than was the case a fortnight ago, but the small number of tonnage jobs maturing is still a discouraging factor in this market. The only large award of the week consisted of 475 tons for a North Philadelphia post office, which was let to McClintic-Marshall Corp. New projects consist of two Philadelphia junior high schools which will require a total of about 600 tons, if and when they are let, and 470 tons for lift and approach spans on a Paulsboro, N. J., bridge, on which bids close April 1. No disposition has been made of the plate requirements of an Erie ferryboat. With the exception of a minimum of miscellaneous demand, the plate market is very dull. Likewise the reinforcing steel market continues very quiet. Concrete Steel Co. will furnish about 100 tons for a North Philadelphia post office, and American Steel Engineering Co. was awarded 230 tons for barracks at Carlisle, Pa. If the two junior high schools at Philadelphia mature, each will require about 600 tons of reinforcing.

Scrap

Prices on important heavy steel grades have eased off, both for domestic and foreign purchases. If any eastern Pennsylvania melter wished steel at the present time,

a sizable tonnage could probably be picked up between \$10.25 and \$10.50. With the exception of Bethlehem, however, it is unlikely that such a purchase will be made in the near future in view of the protracted disinterest of the important steel consumers. Most foundries are not buying cast material in the quantities of a month ago. Domestic activity centers in sporadic purchases by Bethlehem at Washington and Baltimore, at which points the prices on No. 1 and No. 2 steels have been lowered to \$9.50 and \$8.50 respectively. Considerable export material has accumulated on cars at Port Richmond as the result of difficulty in obtaining boats. This condition, together with the general market weakness, has influenced brokers to lower buying prices on No. 1 and No. 2 steels to \$9.75 and \$8.75 a ton respectively. One boat is now loading for Japan, and it is believed that several additional boats will be in shortly.

Imports

The following iron and steel imports were received here last week: 472 tons of chrome ore from British South Africa; 87 tons of steel bars, 57 tons of steel tubes, 17 tons of steel forgings and 9 tons of steel wire from Sweden, and 35 tons of steel bands, 26 tons of structural shapes and 24 tons of steel bars from Belgium.

Boston Exporters Cut Prices on Scrap

BOSTON, March 19.—Local exporters heretofore paying \$8.25 to \$8.50 a ton delivered army base for No. 2 steel, have dropped their price to \$7 to \$7.25, and have made corresponding cuts in prices for old rails, No. 1 heavy melting steel and automobile scrap. In addition, prices for No. 1 and No. 2 steel for Pennsylvania delivery, and for bundled skeleton, have been eased 25c. a ton. The best the American Steel & Wire Co., Worcester, Mass., will pay brokers for No. 1 steel is \$8.50 a ton, f.o.b., and for No. 2 steel, \$7.50. The scrap price structure is therefore quite unsettled, and business has slowed up perceptibly. The cut in export scrap prices is not due to any weakness on the other side of the Atlantic, but rather a corrective move to bring values nearer in line with domestic scrap prices.

Business in pig iron has picked up, but is by no means active. Rice, Barton & Fales, Worcester, Mass., have bought from stock part of the 600 tons of iron inquired for some weeks ago. Other sales brought the total for the week up to around 800 tons.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel Base per Lb.

F.o.b. Pittsburgh	.180c.
F.o.b. Chicago	.185c.
F.o.b. Gary	.185c.
F.o.b. Duluth	.195c.
De'l'd Detroit	.195c.
F.o.b. Cleveland	.185c.
F.o.b. Buffalo	.190c.
De'l'd Philadelphia	.209c.
De'l'd New York	.213c.
F.o.b. Birmingham	.195c.
F.o.b. cars dock Gulf ports	.200c.
F.o.b. cars dock Pacific ports	.235c.

Roll Steel

(For merchant trade)

F.o.b. Pittsburgh	.170c.
F.o.b. Chicago	.175c.
F.o.b. Gary	.175c.
F.o.b. Milwaukee, Wis.	.175c.
F.o.b. Cleveland	.175c.
F.o.b. Buffalo	.180c.
F.o.b. Birmingham	.185c.
F.o.b. cars dock Gulf ports	.190c.
F.o.b. cars dock Pacific ports	.235c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)	
F.o.b. Pittsburgh	.205c.
F.o.b. Chicago	.190c.
F.o.b. Gary	.210c.
De'l'd Detroit	.220c.
F.o.b. Cleveland	.210c.
F.o.b. Youngstown	.210c.
F.o.b. Buffalo	.210c.
F.o.b. Birmingham	.210c.
F.o.b. cars dock Gulf ports	.245c.
F.o.b. cars dock Pacific ports	.245c.

Roll Steel Reinforcing

(Straight lengths as quoted by distributors)	
F.o.b. Pittsburgh	.190c.
F.o.b. Chicago	.195c.
F.o.b. Gary	.195c.
F.o.b. Cleveland	.195c.
F.o.b. Youngstown	.195c.
F.o.b. Buffalo	.195c.
F.o.b. Birmingham	.195c.
F.o.b. cars dock Gulf ports	.230c.
F.o.b. cars dock Pacific ports	.230c.

Iron

F.o.b. Chicago	.180c.
F.o.b. Terre Haute, Ind.	.175c.
F.o.b. Louisville, Ky.	.210c.
F.o.b. Danville, Pa.	.180c.
F.o.b. Berwick, Pa.	.170c.

Cold Finished Bars and Shafting*	
Base per Lb.	
F.o.b. Pittsburgh	.210c.
F.o.b. Chicago	.215c.
F.o.b. Gary	.215c.
F.o.b. Cleveland	.215c.
F.o.b. Buffalo	.220c.
De'l'd Detroit	.230c.
De'l'd eastern Michigan	.235c.

* In quantities of 10,000 to 19,000 lb.

Fence and Sign Posts

Angle Line Posts

Base per Net Ton

F.o.b. Pittsburgh	\$.500
F.o.b. Chicago	50.00
F.o.b. Duluth	51.00
F.o.b. Cleveland	50.00
F.o.b. Buffalo	52.00
De'l'd Detroit	53.00
De'l'd eastern Michigan	53.50

Plates	
Base per Lb.	
F.o.b. Pittsburgh	.180c.
F.o.b. Chicago	.185c.
F.o.b. Gary	.185c.
De'l'd Cleveland	.1985c.
F.o.b. Coatesville	.190c.
F.o.b. Sparrows Point	.190c.
De'l'd Philadelphia	.1985c.
De'l'd New York	.208c.
F.o.b. Birmingham	.195c.
F.o.b. cars dock Gulf ports	.220c.
F.o.b. cars dock Pacific ports	.235c.
Wrought Iron plates, f.o.b. P'gh.	.200c.

Floor Plates

F.o.b. Pittsburgh	.335c.
F.o.b. Chicago	.340c.
F.o.b. Coatesville	.345c.
F.o.b. cars dock Gulf ports	.375c.
F.o.b. cars dock Pacific ports	.390c.

Structural Shapes

Base per Lb.

F.o.b. Pittsburgh	.180c.
F.o.b. Chicago	.185c.
F.o.b. Gary	.185c.
De'l'd Cleveland	.1985c.
F.o.b. Buffalo	.190c.
F.o.b. Bethlehem	.190c.
De'l'd Philadelphia	.2005c.
De'l'd New York	.20325c.
F.o.b. Birmingham (standard)	.195c.
F.o.b. cars dock Gulf ports	.220c.
F.o.b. cars dock Pacific ports	.235c.

Steel Sheet Piling

Base per Lb.

F.o.b. Pittsburgh	.215c.
F.o.b. Chicago	.225c.
F.o.b. Buffalo	.225c.
F.o.b. cars dock Gulf ports	.260c.
F.o.b. cars dock Pacific ports	.260c.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

Base per Lb.

No. 10, f.o.b. Pittsburgh	.185c.
No. 10, f.o.b. Gary	.195c.
No. 10, del'd Detroit	.205c.
No. 10, del'd Phila.	.214c.
No. 10, f.o.b. Birmingham	.200c.

Hot-Rolled Annealed

Base per Lb.

No. 24, f.o.b. Pittsburgh	.240c.
No. 24, f.o.b. Gary	.250c.
No. 24, del'd Detroit	.260c.
No. 24, del'd Phila.	.268c.
No. 24, f.o.b. Birmingham	.255c.

Heavy Cold-Rolled

Base per Lb.

No. 10 gage, f.o.b. Pittsburgh	.250c.
No. 10 gage, f.o.b. Gary	.260c.
No. 10 gage, del'd Detroit	.270c.
No. 10 gage, del'd Phila.	.279c.
No. 10 gage, f.o.b. Birmingham	.265c.

Galvanized Sheets

Base per Lb.

No. 24, f.o.b. Pittsburgh	.310c.
No. 24, f.o.b. Gary	.320c.
No. 24, del'd Detroit	.315c.
No. 24, del'd Phila.	.324c.
No. 24, f.o.b. Birmingham	.310c.

Galvanized Sheets

Base per Lb.

No. 24, f.o.b. Pittsburgh	.310c.
No. 24, f.o.b. Gary	.320c.
No. 24, del'd Detroit	.315c.
No. 24, del'd Phila.	.324c.
No. 24, f.o.b. Birmingham	.310c.

Long Termes

Base per Lb.

No. 24, unassorted 8-lb. coating	.340c.
F.o.b. cars dock Pacific ports	.410c.

Wires Hoops, Twisted or Welded

Base Discounts, f.o.b. Pittsburgh

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade Per Lb.

Bright wire230c.

Spring wire290c.

Chicago prices on products sold to the

manufacturing trade are \$1 a ton above

Pittsburgh or Cleveland. Worcester and

Duluth prices are \$2 a ton above,

Birmingham \$3 above, and Pacific Coast

prices \$9 a ton above Pittsburgh or

Cleveland.

To Jobbing Trade

Qualified jobbers are entitled to a re-

duction of 20c. a 100 lb. from the base

price on carload shipments to stock, and

of 10c. a 100 lb. on less-carload ship-

ments to stock.

Standard Wire Nails

Smooth coated nails260

Galvanized nails:

15 gage and coarser460

16 gage and finer510

Base per Keg

Standard wire nails260

Smooth coated nails260

Base per 100 Lbs.

Annealed fence wire \$2.45

Galvanized fence wire \$2.80

Polished staples \$3.30

Galvanized staples \$3.55

Barbed wire, galvanized \$3.00

Wire fence, base column \$6.00

Chicago and Anderson, Ind., mill prices

are \$1 a ton over Pittsburgh base (on all

products except woven wire fence, for which

the Chicago price is \$2 above Pittsburgh);

Duluth, Minn., and Worcester, Mass., mill

prices are \$2 a ton over Pittsburgh (ex-

ception for woven wire fence at Duluth which

is \$3 over Pittsburgh), and Birmingham

mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and

staples, prices at Houston, Galveston and

Corpus Christi, Tex., New Orleans, Lake

Charles, La., and Mobile, Ala., are

\$6 a ton over Pittsburgh, while Pacific

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine bolts	70, 10 and 5
Carriage bolts	70, 10 and 5
Lag bolts	70, 10 and 5
Flange bolts, Nos. 1, 2, 3 and 7 heads	70, 10 and 5
Hot-pressed nuts, blank or tapped, square	70, 10 and 5
Hot-pressed nuts, blank or tapped, hexagons	70, 10 and 5
C.p.c. and t. square or hex. nuts, blank or tapped	70, 10 and 5
Semi-finished hexagon nuts, U.S.S.	70, 10 and 5
all sizes	70, 10 and 5
Semi-finished hexagon nuts, S.A.E.	70, 10 and 5
1/4 in. to 7/16 in. diameter	70, 10 and 5
1/4 in. to 1 in. diameter	70, 10 and 5
larger than 1 in. diameter	70, 10 and 5
Store bolts in packages, Pittsburgh	75
Store bolts in packages, Cleveland	75
Store bolts in bulk, Pittsburgh	83
Store bolts in bulk, Chicago	83
Store bolts in bulk, Cleveland	83
Tire bolts	60 and 5

Large Rivets

(1/2-in. and larger)

Base per 100 Lbs.

F.o.b. Pittsburgh or Cleveland	\$2.90
F.o.b. Chicago	3.00
F.o.b. Birmingham	3.05

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago	70 and 5
F.o.b. Birmingham	70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 6¢ per 100 lb. on lots of 200 lb. or more)

1/4-in. dia. and smaller	75
Milled cap screws, 1 in. dia. and smaller	70, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread 3/8 in. and smaller	75
Upset hex. head cap screws, U.S.S. or S.A.E. thread, 1 in. dia. and smaller	85
Upset set screws, cut and oval point	75 and 10 to 80
Milled studs	65 to 65 and 10

Alloy and Stainless Steel

Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem	
Uncropped	\$40 per gross ton

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem	
Base price, \$49 a gross ton.	

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton	
Open hearth grade, base.....	2.45c.

Delivered price at Detroit	18.....
S.A.E. O.D. inclusive	2.60c.

Alloy Series	Differential
Numbers	per 100 lbs.
2000 (14% Nickel)	.25
2100 (21/2% Nickel)	.55
2300 (31/2% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
6100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50¢ higher. The differential for cold-drawn bars is 1/2¢ per lb. higher with separate extras.

Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr, 7 to 9% Ni, 0.08 to 0.20% C.)

(Base Prices, f.o.b. Pittsburgh)

Per Lb.

Forging billets

Rolling slabs

Bars

Plates

Structural shapes

Sheets

Hot-rolled strip

Cold-rolled strip

Drawn wire

Raw and Semi-Finished Steel

Carbon Steel Rerolling Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	
Uncropped	\$29 per gross ton

Carbon Steel Forging Ingots

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	
Rerolling	\$27.00

Delivered Detroit

Rerolling	\$30.00
Forging	35.00

Delivered Duluth

Rerolling	\$29.00
Forging	34.00

Delivered Pittsburgh

Rerolling	\$27.00
Forging	32.00

Delivered Chicago

Rerolling	\$29.00
Forging	34.00

Delivered Cleveland

Rerolling	\$29.00
Forging	34.00

Delivered Youngstown

Rerolling	\$29.00
Forging	34.00

Delivered Birmingham

Rerolling	\$29.00
Forging	34.00

Delivered Galveston

Rerolling	\$29.00
Forging	34.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.	
Grooved	Per Lb.

Universal	1.70c.
Sheared	1.70c.

Tube Rounds

F.o.b. Pittsburgh	Base per Lb.
F.o.b. Chicago	1.80c.

F.o.b. Cleveland	1.85c.
F.o.b. Buffalo	1.90c.

F.o.b. Birmingham	1.95c.
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Wire Rods

(Common, base)

F.o.b. Pittsburgh	Per Gross Ton
F.o.b. Cleveland	33.00

F.o.b. Chicago	38.00
F.o.b. Birmingham	39.00

F.o.b. San Francisco	47.00
F.o.b. Galveston	44.00

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil.	2.25 to 2.75.....	\$21.00
No. 2 fdy., sil.	1.75 to 2.25.....	20.50

Malleable	21.00
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FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans

Domestic, 80% (carload)	Per Gross Ton	\$85.00
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Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	Per Gross Ton	\$20.00
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The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton	Per Gross Ton	
6%	22.75	12%

7%	2

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$11.75 to \$12.25
No. 2 heavy melting steel	10.75 to 11.25
No. 2 railroad wrought	11.75 to 12.25
Scrap rails	12.75 to 13.25
Rails, 3 ft. and under	13.75 to 14.25
Compressed sheet steel	11.75 to 12.25
Hand bundled sheet steel	10.50 to 11.25
Hvy. steel axle turnings	10.50 to 11.00
Machin. shop turnings	7.00 to 7.50
Short shov. turnings	7.00 to 7.50
Short hole boreds and turnings	6.00 to 6.50
Cast iron borings	6.00 to 6.50
Cast iron carwheels	12.25 to 12.75
Heavy breakable cast	9.00 to 11.50
No. 1 cast	12.50 to 13.00
Rail, knuckles and couplers	14.00 to 14.50
Rail, coil and leaf springs	14.00 to 14.50
Rolled steel wheels	14.00 to 14.50
Low phos. billet crops	14.50 to 15.00
Low phos. sheet bar crops	14.50 to 15.00
Low phos. plate scrap	14.00 to 14.50
Low phos. punchings	14.00 to 14.50
Steel car axles	14.50 to 15.00

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	\$10.00 to \$10.50
Automobile hvy. melt. steel	9.50 to 10.00
Shoveling steel	10.00 to 10.50
Hydraulic comp. sheets	9.50 to 10.00
Drop forge flashtings	9.00 to 9.50
No. 1 busheling	8.50 to 9.00
Rolled carwheels	11.50 to 12.00
Railroad tires	12.00 to 12.50
Railroad leaf springs	11.50 to 12.00
Axle turnings	9.00 to 9.50
Steel couplers and knuckles	11.50 to 12.00
Coll springs	12.00 to 12.50
Axle turnings (elec. fur.)	10.50 to 11.00
Low phos. punchings	12.00 to 12.50
Low phos. plates, 12 in. and under	12.50 to 13.00
Cast iron borings	3.75 to 4.25
Short shoveling turnings	5.75 to 6.25
Machine shop turnings	5.50 to 6.00
Rerolling rails	12.00 to 12.50
Steel rails, less than 3 ft.	12.50 to 13.00
Steel rails, less than 2 ft.	13.00 to 13.50
Angle bars, stee	12.00 to 12.50
Cast iron carwheels	11.00 to 11.50
Railroad malleable	13.00 to 13.50
Agricultural malleable	9.50 to 10.00

	Per Net Ton
Iron car axles	\$13.50 to \$14.00
Steel car axles	13.50 to 14.00
No. 1 railroad wrought	8.00 to 8.50
No. 2 railroad wrought	8.75 to 9.25
No. 2 busheling	5.00 to 5.50
Locomotive tires, smooth	10.00 to 10.50
Pipe and flues	5.00 to 5.50
No. 1 machinery cast	9.50 to 10.00
Clean automobile cast	9.00 to 9.50
No. 1 railroad cast	8.50 to 9.00
No. 1 agricultural cast	8.50 to 9.00
Stove plate	6.00 to 6.50
Grate bars	6.00 to 6.50
Brake shoes	6.50 to 7.00

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$10.00 to \$10.50
No. 2 heavy melting steel	8.50 to 9.00
No. 1 railroad wrought	10.50 to 11.00
Bundled sheets	9.50 to 10.00
Hydraulically compressed	10.50 to 11.00
Hydraulically compressed, old	7.50 to 8.00
Machin. shop turnings	6.00 to 6.50
Forge turnings	8.50 to 9.00
Cast borings	5.00 to 5.50
Stove plate (steel works)	8.25 to 9.00
Heavy breakable cast	15.00 to 15.50
No. 1 low phos. heavy	15.00 to 15.50
Couplers and knuckles	11.00 to 11.50
No. 1 blast furnace	5.00 to 5.50
Spec. iron and steel pipe	8.00 to 8.50
Shafting	17.00 to 17.50
Steel axles	16.50 to 17.00
No. 1 forge fire	9.50 to 10.00
Cast iron carwheels	11.50 to 12.00
No. 1 cast	11.00 to 11.50
Cast borings (chem.)	12.00 to 14.00
Steel rails for rolling	12.00 to 12.50

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$7.75 to 8.25
No. 2 heavy melting steel	6.25 to 6.75
Scrap calls for melting	6.75 to 8.25
Loose sheet clippings	4.25 to 4.75
Bundled sheets	5.75 to 6.25
Cast iron borings	1.25 to 1.75
Machin. shop turnings	1.25 to 1.75
No. 1 busheling	5.75 to 6.25
No. 2 busheling	2.50 to 3.00
Rails for rolling	8.75 to 9.25
No. 1 locomotive tires	7.00 to 7.50
Short rails	11.25 to 11.75
Cast iron carwheels	7.75 to 8.25
No. 1 machinery cast	9.00 to 9.50
No. 1 railroad cast	8.25 to 8.75
Burnt cast	5.75 to 6.25
Stove plate	5.75 to 6.25
Agricultural malleable	7.75 to 8.25
Railroad malleable	8.75 to 9.25

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	\$10.25 to \$10.75
No. 2 heavy melting steel	9.75 to 10.00
Compressed sheet steel	9.50 to 10.00
Light bundled sheet stamping	7.00 to 7.50
Drop forge flashtings	9.00 to 9.50
Machin. shop turnings	6.50 to 7.00
Short shoveling turnings	7.00 to 7.50
No. 1 busheling	9.00 to 9.50
Steel axle turnings	9.00 to 9.50
Low phos. billet crops	11.50 to 15.00
Cast iron borings	7.00 to 7.50
Mixed borings and short turnings	7.00 to 7.50
Cast iron carwheels	12.00 to 12.50

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel	\$8.75 to \$9.25
No. 1 heavy melting	8.00 to 8.50
No. 2 heavy melting	7.25 to 7.75
No. 1 locomotive tires	9.75 to 10.25
Misc. stand-sec. rails	10.00 to 10.50
Bundled sheets	6.00 to 6.50
No. 1 busheling	5.00 to 5.50
Cast iron borings and shoveling turnings	4.00 to 4.50
Rails for rolling	10.50 to 11.00
Machin. shop turnings	4.00 to 4.50
Heavy turnings	5.50 to 6.00
Steel car axles	13.00 to 13.50
Iron car axles	15.00 to 16.00
Cast iron carwheels	11.75 to 12.25
Steel angle bars	9.50 to 10.00
Cast iron carwheels	7.50 to 8.00
No. 1 machinery cast	9.00 to 9.50
Railroad grade bars	7.00 to 7.50
Stove plate	8.00 to 8.50
Rails for rolling	14.50 to 15.00
Stove plate	8.50 to 9.00
Railroad malleable	13.00 to 13.50
Cast iron carwheels	12.00 to 12.50

DETROIT

Dealers' buying prices per gross ton:

Heavy melting steel	\$7.50 to \$8.00
Borings and short turnings	4.25 to 4.75

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	\$10.50 to \$11.00
No. 2 heavy melting steel	9.00 to 9.50
Scrap rails	11.00 to 11.50
New hydraulic comp. sheets	9.00 to 9.50
Old hydraulic comp. sheets	8.00 to 8.50
Drop forge flashtings	9.50 to 10.00
No. 1 busheling	8.00 to 8.50
Machine shop turnings	5.50 to 6.00
Knickles and couplers	11.50 to 12.00
Cast iron and leaf springs	12.00 to 12.50
Rolled steel wheels	11.50 to 12.00
Low phos. billet crops	12.00 to 12.50
Low phos. sheet bar crops	12.00 to 12.50
Low phos. punchings	12.00 to 12.50
Steel car axles	12.00 to 12.50

BOSTON

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$8.25 to \$8.50
No. 1 heavy melting	6.25 to 6.50
Scrap T rails	8.50
No. 2 steel	7.00 to 7.25
No. 2 steel	5.50 to 5.75
Breakable cast	5.75 to 6.00
Machin. shop turnings	2.00 to 2.25
Bundled skeleton, long	5.00 to 5.25
Forge flashtings	5.00 to 5.25
Mixed borings and turnings	1.00 to 1.50
Shafting	12.00 to 12.50
Steel car axles	11.50 to 12.00
Cast iron borings, chemical	6.50 to 7.00
Stove plate	4.00 to 4.25

Per gross ton delivered consumers' yards:

Textile cast	\$9.00 to \$9.50
No. 1 machinery cast	9.00 to 9.50
Stove plate	9.00 to 9.50
Railroad malleable	11.00 to 11.50

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	\$8.00 to \$9.00
No. 2 heavy melting steel	7.00 to 7.50
Heavy breakable cast	6.00 to 6.25
No. 1 machinery cast	7.50 to 8.00
No. 2 cast	6.50 to 7.00
Stove plate	6.00 to 6.50
Steel car axles	13.50 to 14.00
No. 1 railroad wrought	7.00 to 7.50
No. 1 yard wrought, long	6.00 to 6.50
Spec. iron and steel pipe	4.50 to 5.00
Forge fire	5.50 to 6.00
Rails for rolling	9.00 to 9.50
Short shoveling turnings	2.00 to 3.00
Machin. shop turnings	2.50 to 3.00
Cast borings	3.50 to 3.75
No. 1 blast furnace	2.00 to 2.50
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	4.50 to 5.00

* For direct car loading only.
† Loading on barge.

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	\$9.00 to \$9.50
Scrap steel rails	10.00 to 10.50
Short shoveling turnings	7.00 to 7.50
Steel axles	11.50 to 12.00
Iron axles	11.50 to 12.00
No. 1 railroad wrought	7.00 to 7.50
Rails for rolling	12.50 to 13.00
No. 1 cast	9.50 to 10.00
Tramcar wheels	10.00 to 10.50

ST. LOUIS

Per gross ton delivered consumers' yards:

Selected heavy steel

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock:	
Rounds and hexagons	*3.45c.
Squares and flats	*3.45c.
Hoops and bands under $\frac{1}{4}$ in.	3.20c.
Hot-rolled annealed sheets (No. 24)	
25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more	
bundles	3.30c.
Hot-rolled sheets (No. 10)	3.95c.
Galv. corrug. sheets (No. 28), per	
square (more than 3750 lb.)	\$3.69
Spirals, large	2.90c.
Tire steel, 1 $\times \frac{1}{2}$ in. and larger	3.65c.
Track bolts, all sizes, per 100 count,	
65 per cent off list	
Machine bolts, 100 counts	
65 per cent off list	
Carriage bolts, 100 count,	
65 per cent off list	
Nuts, all styles, 100 count,	
65 per cent off list	
Boiler tubes	Per 100 ft.
Lap welded, 2-in.	\$18.00
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65
*No. 28 and lighter, 36 in. wide, 20c.	
higher per 100 lb.	

On plates, structural, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars	2.95c.
Cold-fin. steel bars:	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	4.00c.
Machine bolts	Per Cent Off List
60 and 5	
Carriage bolts	60 and 5
Lag screws	60 and 5
Hot-pressed nuts, sq. tap. or	
blank	60 and 5
Hot-pressed nuts, hex. tap or	
blank	60 and 5
Hex. head set screws	80
Cut point set screws	70 and 10
Flat head bright wood screws	37 1/2 and 10
Spring cotter	50
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and	
smaller	57 1/2
Wrought washers	\$4.50 off list
No. 8 black ann'l'd wire per 100 lb.	\$3.85
Com. wire nails, base per kg.	3.05
Cement c'd'ed nails, base per keg	3.05

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies to orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

NEW YORK

	Base per Lb.
Plates, $\frac{1}{4}$ in. and heavier	3.40c.
Structural shapes	3.37c.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	2.95c.
Cold-finished steel bars	3.40c.
Flat-rolled steel under $\frac{1}{4}$ in.	3.36c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide	
sheets	3.50c.
Black ann'l'd wire, per 100 lb.	\$2.65
No. 9 galv. wire, per 100 lb.	3.00
Com. wire nails, base per kg.	2.40

*Plus mill, size and quantity extras.

*Outside delivery 10c. less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shafting, screw stocks	3.74c.
Hot-rolled annealed sheets (No. 24)	4.00c.
Galv. sheets (No. 24)	4.64c.
Hot-rolled sheets (No. 10)	3.29c.
Black corrug. sheets (No. 24)	4.00c.
*Galv. corrug. sheets	4.64c.
Structural rivets	4.35c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	\$2.91
Com. wire nails, base per kg.:	
1 to 24 kgs	3.50
25 to 50 kgs	3.30
Large quantities	3.10
Cement c'd'ed nails, base 100-lb. kg	3.50
Chain, 1-in., per 100 lb.	8.35
Net per 100 Ft.	
Seamless steel boiler tubes, 2-in.	\$19.03
4-in.	44.96
Lap-welded steel boiler tubes, 2-in.	18.10
4-in.	42.32

BUFFALO

	Base per Lb.
Plates	3.37c.
Struc. shapes	3.25c.
Soft. steel bars	3.00c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.55c.
Round and hex.	3.55c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.05c.
Heavy hot-rolled sheets, 3/16 in.	
24 to 48 in. wide	3.62c.
Galv. sheets (No. 24)	4.70c.
Bands	3.42c.
Hoops	3.42c.
Hot-rolled unannealed sheets	3.17c.
Com. wire nails, base per kg.	\$3.33
Black wire, base per 100 lb.	3.55

BOSTON

	Per Lb. Base
Beams, channels, angles, tees, zees	3.52c.
Plates—sheared, tank and univ. mill	3.52c.
$\frac{1}{4}$ in. thick and heavier	3.53c.
Floor plates, diamond pattern	5.33c.
Bar and bar shapes (mild steel)	3.30c.
Band, 3/16 in. thick and	
No. 12 ga. incl.	3.60c. to 4.80c
Half rounds, half ovals, ovals and	
bevels	4.55c.
Tire steel	4.55c.
Cold-finished rounds, squares and	
hexagons	4.00c.
Cold-rolled strip steel	3.245c.

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are le. a lb. higher.

	Base per Lb.
High speed	57c.
High carbon chrome	37c.
Oil hardening	22c.
Extra	17c.
Regular	14c.

Weekly Indications of Steel Activity

From THE IRON AGE

Mar. 19, 1935 Mar. 12, 1935 Feb. 19, 1935 Mar. 20, 1934

Steel ingot operations—Per cent of capacity 47.0 47.5 50.5 48.5

Average, Year to Date

1935 1934

49.7 40.0

Year to Date

1935 1934

	Week Ended Mar. 19, 1935	Mar. 12, 1935	Feb. 19, 1935	Mar. 20, 1934
Fabricated structural steel awards	45,800	6,450	13,250	29,200
Fabricated plate awards	1,425	1,325	700	320
Sheet steel piling awards	915	0	0	0
Reinforcing bar awards	7,800	2,250	2,150	2,150

49,490 47,350

Tin Quotations Decline Steadily as Lead is Marked Up \$1 a Ton

International Conference on Copper Curtailment Reported to Be Making Progress—Zinc Prices Firm and Demand Steady

NEW YORK, March 19.—The attention of the copper trade is still centered on the international production curtailment discussions now being carried on here, although no definite announcements regarding the conference have been forthcoming. It is generally believed that favorable progress is being made, and the market tone remains rather buoyant. Regular buying of copper is not being affected by the conferences, and sales yesterday amounted to 1100 tons, bringing the total for the month up until today to 18,500 tons. It seems reasonably certain the "book" established by the code will be more than covered during the month. The price, of course, is unchanged at 9c. a lb., delivered Connecticut Valley, and the market abroad this morning

was holding around 6.65c. a lb., usual Continental base ports.

Tin

Tin prices have declined steadily over the past week, and the falling tendency was accentuated yesterday. Fluctuations in sterling have also been rather violent, and the New York market on tin has been rather difficult to establish. A little domestic buying accompanied the price decline, but in no case were commitments large. Straits metal was quotable in New York today at about 45.50c. a lb., compared with 46.80c. one week ago. In London, spot standard was priced this morning at £208, and futures at £204 10s. Straits metal at London was offered at £210 10s., while the market in the East was £214 2s. 6d. Tin mills in this coun-

try are operating at 85 per cent of capacity.

Lead

The recent steady character of the lead market led producers to advance prices \$1 a ton, yesterday, to 3.45c. a lb., St. Louis, and 3.60c., New York. At the same time, the St. Joseph Lead Co. advanced its eastern price to 3.65c., thus maintaining the recent differential over the quotations of other producers. The increase has resulted in considerable buying in the last two days. April lead is now being taken in larger amounts, although the hand-to-mouth character of demand is still noticeable. Consumption seems to be well maintained. In the Tri-State field ore prices have also been marked up, with sales of carload lots at \$33 a ton reported. Larger quantities are commanding \$35 and \$36 a ton.

Zinc

Buying of zinc is not active, but is considered fairly satisfactory. Sales last week amounted to about 2400 tons, compared with 3700 in the previous period, and with 7000 tons in the previous week when prices were being advanced rather sharply. Recent quotations of 4.25c. a lb., New York, and 3.90c., East St. Louis, are being generally adhered to, and the market seems to be in the best position in several months. Consumption is not increasing markedly, but spring weather is expected to bring improved activity to the galvanizing trade. Prices on zinc concentrates are unchanged at \$25 and \$26 a ton.

The Week's Prices. Cents Per Pound for Early Delivery

	Mar. 13	Mar. 14	Mar. 15	Mar. 16	Mar. 18	Mar. 19
Electrolytic copper, N. Y.*	8.75	8.75	8.75	8.75	8.75	8.75
Lake copper, N. Y.	9.12 1/2	9.12 1/2	9.12 1/2	9.12 1/2	9.12 1/2	9.12 1/2
Straits tin, Spot, New York	47.10	47.15	47.00	45.80	45.50	
Zinc, East St. Louis	3.90	3.90	3.90	3.90	3.90	
Zinc, New York	4.25	4.25	4.25	4.25	4.25	
Lead, St. Louis	3.40	3.40	3.40	3.45	3.45	
Lead, New York	3.55	3.55	3.55	3.60	3.60	

*Refinery quotations; price 1/4c. higher delivered in Connecticut.

Aluminum, virgin 99 per cent plus, 19c. to 22c. a lb., delivered.
Aluminum, remelt No. 12 (alloy), carload lots delivered, 14c. a lb., average for week.
Nickel, electrolytic, 35c. to 36c. a lb. base at refinery in lots of 2 tons or more.
Antimony, 14.50c. a lb., New York.

Brass ingots, 85-5-5-5, 8.25c. a lb., New York and Philadelphia.

From New York Warehouse

Delivered Prices, Base per Lb.	
Tin, Straits pig	47.75c. to 48.75c.
Tin, bar	49.75c. to 50.75c.
Copper, Lake	10.25c. to 11.00c.
Copper, electrolytic	10.00c. to 10.50c.
Copper, castings	9.75c. to 10.75c.
*Copper sheets, hot-rolled	16.00c.
*High brass sheets	14.25c.
*Seamless brass tubes	16.00c.
*Seamless copper tubes	16.25c.
*Brass rods	12.75c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	4.50c. to 5.50c.
Lead, bar	5.50c. to 6.50c.
Lead, sheets	7.25c.
Antimony, Asiatic	15.50c. to 16.50c.
Alum, virgin, 99 per cent, plus	23.30c.
Alum, No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, 1/2 and 1/4	30.00c. to 31.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.	
Tin, Straits pig	50.25c.
Tin, bar	52.25c.

Copper, Lake	10.00c.
Copper, electrolytic	10.00c.
Copper, castings	9.75c.
Zinc, slabs	5.50c. to 5.75c.
Lead, American pig	4.50c. to 4.75c.
Lead, bar	7.75c.
Antimony, Asiatic	16.50c.
Babbitt metal, medium grade	18.50c.
Babbitt metal, high grade	55.25c.
Solder, 1/2 and 1/4	30.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	5.62 1/2c.
Copper, hvy. and wire	5.50c.
Copper, light and bottoms	4.50c.
Brass, heavy	2.87 1/2c.
Brass, light	2.12 1/2c.
Hvy. machine composition	4.50c.
No. 1 yel. brass turnings	3.87 1/2c.
No. 1 red brass or compos. turnings	4.12 1/2c.
Lead, heavy	2.62 1/2c.
Zinc	2.00c.
Cast aluminum	10.12 1/2c.
Sheet aluminum	11.50c.
	11.00c.

THREE publications on theoretical and experimental electronics and electron-tube applications, originally published for educational institutions, have been made broadly available by the General Electric Co., Schenectady. One of them, entitled "Electronics and Electron Tubes," and written by E. D. McArthur, outlines the fundamentals underlying the vacuum tube, and includes simple experiments to illustrate these fundamentals. The other two publications deal with laboratory experiments on electron-tube theory and on electron-tube applications respectively. The former is an experimental supplement to Mr. McArthur's "Electronics and Electron Tubes," and the latter is a laboratory manual covering a number of fundamental electron-tube applications. These booklets are obtainable at a nominal price from the educational section of General Electric Co.

Railroad Equipment

Chesapeake & Ohio is asking for bids on freight car repair materials.

U. S. S. R. is inquiring for several switching locomotives through Amtorg Trading Corp., New York.

Pere Marquette is inquiring for materials to repair freight cars.

United States Engineer Office, Rock Island, Ill., will close bids March 29 for one flat car.

San Francisco has awarded a contract to Edgewater Steel Co., Oakmont, Pa., for 200 rolled steel street car wheels.

RAILS

Chicago & North Western will soon enter the market for 25,000 tons of rails and 8000 tons of fastenings.

New York Central has distributed orders for 9000 tons of track fastenings.

Cast Iron Pipe

Wareham, Mass., will close bids March 21 on 56,500 ft. of 6 to 10-in. and 22 tons of 4 to 12-in. fittings.

Hinsdale, N. H., will close bids April 4 on intake works and purification plant, cast iron pipe, and steel standpipes.

Evanston, Ill., has awarded 850 tons of 16-in. to Glamorgan Pipe & Foundry Co.

Campbellsport, Wis., closes bids April 2 for construction of waterworks and sewer systems requiring about 200 tons of 6 and 8-in. class C.

Stratford, Wis., has placed 4000 ft. of 8-in. class C with Central Foundry Co.

Procurement Officer, Chemical Warfare Service, Edgewood Arsenal, Md., closes bids March 25 for black and galvanized pipe, couplings and other fittings (Circular 107).

Madison Heights, Va., plans water pipe lines; also waterworks station and service facilities. Fund of \$88,500 has been secured through Federal aid. Elmer E. Barnard, Madison Heights, is consulting engineer.

Childersburg, Ala., will soon take bids for pipe lines, 100,000-gal. elevated steel tank, pumping station and other waterworks equipment. Fund of \$39,000 is available. John M. Gilfillan & Associates, 619 North Tenth Street, Birmingham, are consulting engineers.

Julesburg, Colo., plans water pipe lines; also new pumping machinery and auxiliary equipment. Special election is being arranged to vote bonds for \$70,000 for project.

Smithfield, Ohio, will soon take bids for water pipe lines; also for other waterworks equipment. Cost about \$60,000. Harrop, Hopkins & Taylor, 541 Wood Street, Pittsburgh, are consulting engineers.

Belle, Mo., plans pipe lines for water system; also waterworks equipment. Cost about \$52,000. Special election has been called April 2 to approve bonds. J. W. Shikles & Co., New York Life Building, Kansas City, Mo., are consulting engineers.

LaFollette, Tenn., plans immediate call for bids for pipe for water system, waterworks station and other distribution facilities. Cost about \$175,000. Freeland, Roberts & Co., Nashville, Tenn., are consulting engineers.

Healdsburg, Cal., has authorized immediate call for bids for 6000 ft. of 4-in. for water mains.

Mountain Home, Idaho, plans early call for bids for 37,180 ft. of 4, 6 and 8-in. for water system; also for valves, fittings, etc. Cost about \$43,000. James Spafford, Mountain Home, is engineer.

Portland, Ark., closes bids early in April for water pipe lines; also for elevated steel tank and tower. Cost about \$32,000. Hugh R. Carter, National Standard Building, Little Rock, Ark., is consulting engineer.

Louisiana, Mo., asks bids until April 1 for pipe lines, reservoir, filtration plant and other waterworks equipment. Fund of \$156,000 has been arranged for this and sewage system improvements.

Beverly Hills, Cal., will take bids March 26 on 162 tons.

STEEL FOR INDUSTRY

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BISSETT STEEL DIVISION

Pipe Lines

Construction Service, Veterans' Administration, Washington, asks bids until April 16 for steel pipe gas mains at institution at Castle Point, N. Y.

Tacoma, Wash., will ask bids early in April for third unit of Green River gravity pipe line system, including steel pipe as follows: 550 ft. 58-in. (with alternate bids on reinforced concrete); 13,490 ft. 52-in. (alternate bids on reinforced concrete); 5698 ft. 48-in.; and 1136 ft. 42-in. W. A. Kunigk is water superintendent.

Marysville, Wash., plans 10-in. steel pipe from Lakewood Springs for gravity water line. Board of Snohomish County Commissioners are considering petition of municipality for permission to secure water from source noted. Financing will be arranged soon.

Fruita, Colo., has low bids from J. S.

Schwartz Construction Co., Colorado Springs, Colo., for 6850 ft. of 8-in. steel pipe for main water line; also, from same company, for 30,000 ft. 4-in. cast iron pipe for distribution system.

Public Utilities Commission, San Francisco, has low bid from Pacific Bridge Co., San Francisco, for double 54-in. steel pipe line, about 2800 ft., each, across San Francisco Bay at Dumbarton Strait, comprising submarine installation on pile trestles; also for 435 ft. of 54-in. steel pipe across Newark Slough, near Newark, Cal., at \$698,226.25 (Specification W. D. 53).

Lyons, Kan., plans call for bids early in April for steel pipe lines for municipal gas distribution system; also for gas distributing station. Bond issue of \$75,000 has been arranged. F. E. DeWitt, Wheeler-Kelly-Hagney Building, Wichita, Kan., is consulting engineer.

Enterprise, Utah, will take bids March 30 on 273 tons of 4 and 6-in. steel pipe.

Fabricated Structural Steel

Awards Heavy—New Projects in Light Volume

LETINGS of 45,800 tons, the largest since the first week in May, 1933, are swelled by 33,000 tons for suspension spans and approaches for the Tri-borough bridge in New York, and 4250 tons for transmission towers for the Norris Dam in Alabama. New projects of 6025 tons compare with 32,110 tons in the previous week and 16,300 tons two weeks ago. The only sizable new job is 1000 tons for a Federal office building in Buffalo. Plate awards total 1425 tons. Included in new plate projects of more than 4800 tons, is 3000 tons for a welded pipe line for the Department of Water and Power, Los Angeles. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Portland, Me., 160 tons, State highway bridge, to McClintic-Marshall Corp.

New York, 33,000 tons, suspended spans and approaches for Triborough bridge, to McClintic-Marshall Corp.

Long Island Railroad, 1400 tons, grade crossing elimination at St. Albans; National Bridge Works, erector; Jones & Laughlin Steel Corp., fabricator.

Philadelphia, 475 tons, post office, to McClintic-Marshall Corp.

Lancaster, Pa., 195 tons, building for Armstrong Cork Co., to A. B. Rote Co.

Buffalo, 600 tons, police headquarters, to Buffalo Structural Steel Corp.

SOUTH AND SOUTHWEST

Norfolk, Va., 660 tons, highway bridge over Hampton Boulevard, to American Bridge Co.

Virginian Railway Co., 230 tons, bridge at Elmore, W. Va., to Virginia Bridge & Iron Co.

Sheffield, Ala., 1745 tons, service and emergency gates for Tennessee Valley Authority; 1490 tons, to Bartlett Hayward Co.; 190 tons, to Ingalls Iron Works; 65 tons, to Virginia Bridge & Iron Co.

Norris Dam, Ala., 4250 tons, 664 transmission towers, to American Bridge Co. and Nashville Bridge Co.

Henrietta, Okla., 1200 tons, Pittsburgh Plate Glass Co., to McClintic-Marshall Corp.

State of Louisiana, 500 tons, bridges, to Jones & Laughlin Steel Corp.

CENTRAL STATES

Detroit, 220 tons, building for American Metal Products Co., to R. C. Mahon Co.

Clermont County, Ohio, 100 tons, State highway bridge, to McClintic-Marshall Corp.

State of Illinois, 175 tons, highway bridges at Venice and Rantoul, to McClintic-Marshall Corp.

Gary, Ind., 300 tons, grade crossing elimination, to McClintic-Marshall Corp.

WESTERN STATES

San Diego, 450 tons, Ford Motor Co. building for California Pacific International Exposition; 300 tons, to Pacific Coast Steel Corp.; 150 tons, to Consolidated Steel Corp.

Ventura County, California, 225 tons, State highway, to Columbia Steel Co.

Oakland, Cal., 100 tons, American Manganese Co. plant, to Pacific Coast Steel Corp.

Sanger, Cal., 117 tons, County bridge, to Minneapolis-Moline Power Implement Co.

Seattle, 233 tons angles, material for city, to an unnamed bidder.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Lowell, Mass., 200 tons, street railway garage.

New York Central Railroad, 500 tons, grade crossing elimination at Utica, N. Y.; bids taken March 19.

Jersey City, N. J., 350 tons, science building, St. Peters College.

Paulsboro, N. J., 470 tons, lift and approach spans; tenders due April 1.

Buffalo, 1000 tons, Federal office building.

SOUTH AND SOUTHWEST

Norris Dam, Ala., 450 tons, trash racks.

Lexington, Va., 440 tons, State highway bridge.

Alfalfa County, Oklahoma, 719 tons, highway bridge; bids opened March 19.

State of Oklahoma, 500 tons, bridges.

State of Texas, 300 tons, bridges.

CENTRAL STATES

Detroit, 400 tons, addition to Chrysler Corp. Dodge truck plant.

Rock Valley, Ia., 230 tons, State highway bridge.

State of Missouri, 500 tons, highway bridges; including Pike County, 230 tons, and Christian County, 120 tons; bids March 26.

WESTERN STATES

Bonneville Dam, Ore., 380 tons, derrick and ship emergency lock; Pacific Car & Foundry Co. low bidder.

Ellensburg, Wash., 135 tons, State undercrossing; bids April 2.

Odair, Wash., 300 tons, mixing plant.

FABRICATED PLATE

AWARDS

San Francisco, 1300 tons, Hetch Hetchey trans-bay pipe line crossing, to Western Pipe & Steel Co.

Ventura, Cal., 125 tons, material for city, to Consolidated Steel Corp.

NEW PROJECTS

Grand Haven, Mich., 475 tons, scows.

Milwaukee, 350 tons, two dump scows for United States Engineer Office; McClintic-Marshall Corp., low bidder.

San Francisco, 243 tons, Crystal Springs tunnel linings; bids April 3.

Fort Peck, Mont., 350 tons, pipe and connecting links; Babcock & Wilcox Co. and McClintic-Marshall Corp., low bidders.

Los Angeles, 3000 tons; 65,000 ft. of 31-in. welded pipe for Department of Water and Power, Specification 1641; bids March 26.

Everett, Wash., 400 tons, city pipe line; plans completed.

SHEET PILING

AWARDS

Ventura County, California, 916 tons, State highway, to Columbia Steel Co.

NEW PROJECTS

Zanesville, Ohio, 1200 tons of temporary piling for Mohawk dam; bids taken by United States Engineer March 19.

Reinforcing Steel

Awards 7800 Tons—New Projects
3700 Tons

AWARDS

Hartford, Conn., 200 tons, school, to Truscon Steel Co.

New York, 900 tons, track depression work for New York Central Railroad; 600 tons to Truscon Steel Co. and 300 tons to Fireproof Products Co.

New York, 750 tons, Tri-borough bridge piers, divided between Kalman Steel Corp. and Fireproof Products Co.

Coney Island, New York, 650 tons, sewage plant, to Kalman Steel Corp.

St. Albans, N. Y., 225 tons, Long Island Railroad bridge, to National Bridge Co.

Relay, Md., 450 tons, rack house for Maryland Distillery, Inc., to Concrete Steel Co.

Chicago, 100 tons, Wander Co., to Joseph T. Ryerson & Son; previously reported to an unnamed bidder.

Chicago, 475 tons, Goldblatt department store, to an unnamed bidder.

State of Illinois, 130 tons, culverts, to Concrete Engineering Co.

Denver, 3580 tons, enlarging and lining Moffatt tunnel, intake shaft, wye and appurtenant works; general contract awarded to Utah-Bechtel-Morrison, Inc., Ogden, Utah; steel to Colorado Fuel & Iron Products Co.

Flathead County, Montana, 102 tons, two State bridges, to an unnamed bidder.

Luse, Ore., 205 tons, material for Owyhee project, to Pacific Coast Steel Corp.

Lewis County, Washington, 100 tons, Bureau of Public Roads bridge over Laughing Water Creek, to Soule Steel Co.

NEW REINFORCING BAR PROJECTS

New York, 220 tons, sewer project in Bronx.

State of Ohio, 225 tons, dams at Beach City and Piedmont, Muskingum watershed control project; bids early in May.

Cleveland, 700 tons, Federal housing project; bids April 23.

Zanesville, Ohio, 120 tons, Piedmont Dam in connection with Muskingum District Conservation project; bids April 10.

Zanesville, 600 tons of reinforcing, as well as some stainless steel for gates, for Dover dam; bids to be taken in April.

Zanesville, 150 tons of reinforcing steel and structural steel for Senecaville dam; bids to be taken in April.

State of Texas, 450 tons, bridges.

Chicago, 750 tons, west side sewer project; S. A. Healy, low bidder.

La Crosse, Wis., 100 tons, bridges; bids April 2.

St. Louis, 480 tons, Southwest high school; bids opened March 18.

San Francisco, 120 tons, Patrick Henry school; bids March 27.

Salt Lake City, Utah, 435 tons, Moon Lake dam; general contract awarded and Bureau of Reclamation will take bids soon on material.

Modena, Cal., 100 tons, County hospital; bids under advisement.

Detroit Scrap Market Soft

DETROIT, March 19.—The local scrap market has grown weaker, although with a single exception no actual decreases have been recorded in prices. Completion of shipments of sheet clippings on a large current contract has brought a slump of \$1 a ton in that item. The expectation of continued production of old material on a large scale for the next 60 days is having a depressing effect and probably will show up in lower prices within the next week. The first boatload of scrap destined for Cleveland hasn't yet moved away from the Nicholson dock, although it should be dispatched before the week is out.

X-Ray Department Is Opened by Laboratory

THE Gray Industrial Laboratories, 961 Frelinghuysen Avenue, Newark, N. J., under the supervision of Dr. David Drogin, has announced the establishment of an X-ray department for the inspection and testing of materials. Equipment is said to have been specially designed and assembled to give economical service. Assembly, installation and operation of equipment are under the direction of Robert C. Woods, formerly of the X-ray and radium research department of the Memorial Hospital, New York.

Demand Eases In Southern Ohio

CINCINNATI, March 19.—Easing of automotive demand for finished sheets has been reflected in a slight decrease in total mill bookings. However, rolling schedules in all items except hot rolled sheets are being held at close to 90 per cent of capacity to assure delivery on all first quarter business. Backlogs, built up over the past month, will sustain near capacity production through April. The moderate activity among jobbers is encouraging.

Pig iron meltters are feeling their way and are making no anticipa-

tory purchases. Current business, while averaging near 800 tons weekly, consists entirely of small orders for immediate use. The melt fluctuates within narrow limits, but is better than last quarter. Specialty and stove foundries are leading in production, although some machine tool meltters indicate moderately better business.

Seasonal influences in steel warehouse business are reflected in moderate improvement this month. Jobbers report that business volume for March exceeds that of

February despite the absence of substantial construction demand.

Fear of a coal strike tends to restrict mill purchases of scrap. Prices are steadily softening and all items are down 25c. a ton.

McQuay-Norris Mfg. Co., St. Louis, had net income of \$478,580 for year ended Dec. 31, compared with \$376,775 in 1933. The 1934 earnings were the best since 1929. Business volume for the first two months of 1935 was substantially greater than for the same period in 1934.

4 of 20 *reasons why Brass usually costs less for screw machine products*

No. 4

The production ratio of brass rod is at least 4 to 1 as compared with cold rolled Bessemer steel screw stock.

No. 8

Tool life on brass is from 4 to 8 times longer than on steel.

No. 11

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No. 12

A machined finish on brass is always better than on steel; threads are cleaner and knurls are sharper.

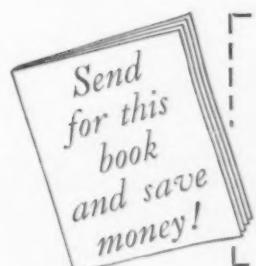
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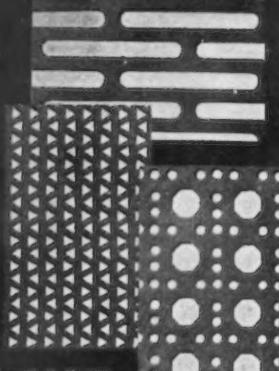
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ANACONDA COPPER & BRASS

THE IRON AGE, March 21, 1935—65

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OBITUARY

JOEL S. COFFIN, chairman of the board of the Lima Locomotive Works, Inc., Lima, Ohio, died at Miami Beach on March 11, aged 74 years. After some years of service in railroad work, he entered the employ of the Galena Signal Oil Co. in 1892 as a member of its mechanical expert staff and was advanced to the management of the department four years later. He was elected vice-president in 1907. He resigned in 1909 to become vice-president of the American Brake Shoe & Foundry Co. In the meantime, in 1902, he had or-

ganized the Franklin Railway Supply Co., of which he became president. He later was active in organizing the American Arch Co. and the Locomotive Superheater Co., and he resigned from the American Brake Shoe company in 1911 to devote his entire time to the management of these companies. Mr. Coffin became chairman of the board of the Lima Locomotive Works, Inc., in 1916.

* * *

WILLIAM BROWNLIE ALEXANDER, general superintendent and director, National Screw & Mfg. Co., Cleveland, died March 17, aged 50 years. He was a brother of Harold Alexander, president of the company, and son of W. D. B. Alexander, the company's founder.

* * *

CAPT. WALTER M. MCFARLAND, for 20 years manager of the marine department of the Babcock & Wilcox Co., New York, died at his home in Washington, March 4, aged 76 years. He retired in 1931.

* * *

JAMES F. LEAHY, general superintendent of the Buffalo plant of the Farrel-Birmingham Co., Inc., died at his home in Kenmore, N. Y., on March 6, after a month's illness. He was born in Torrington, Conn., Oct. 23, 1870, and resided in Ansonia for 22 years, where he had been in the employ of the Farrel company since Dec. 2, 1901. He had served as machine shop foreman at the Ansonia plant before being transferred to the superintendency at Buffalo 12 years ago.



Joel S. Coffin

RALPH H. CLORE, general sales manager of the Medart Co., St. Louis, died on March 6.

* * *

THEODORE A. GESSLER, formerly manager of sales at New York for the American Sheet & Tin Plate Co., died at his winter home in Miami on March 3, aged 62 years. He was associated with the steel industry for many years, having first become identified with the American Tin Plate Co. in 1898. He continued with the company when it was taken over by the United States Steel Corp., and later merged into the American Sheet & Tin Plate Co. He retired from active business in 1922.

* * *

JOHN E. FISHER, who had been associated with the Ohio Steel Foundry Co. since 1910, died at his home in Lima, Ohio, on Jan. 20, aged 69 years. He was at one time superintendent of the National Transit Co., Oil City, Pa.

* * *

JOHN THORSON SEAMAN, president and general manager of the Sea-Thor Brass Foundry Co., Milwaukee, died March 13 from injuries sustained in an automobile accident. He was 58 years old and a native of Milwaukee.

* * *

JOHN PARTRIDGE, who was prominently identified with the scrap business in Philadelphia for more than 30 years, died in that city on March 6, aged 53 years. He was continuously associated with the Charles Dreifus Co. for a number of years, except for a 10-year period, when he was a member of the firm of Allan R. Hoffer Co., Philadelphia. In his early experience he was a purchasing agent for a steel company in the Philadelphia district and also for a steel company in the Steubenville, Ohio, district. He was active in the Philadelphia office of the Dreifus company at the time of his death.

A motion picture entitled "The Multi-Flame Welding Head" has been made available by the Linde Air Products Co., 30 East Forty-second Street, New York, for use by industrial groups and in schools. It was filmed for the most part in the Mid-West pipe line fields, the scenes being largely of work on new oil lines. It first explains briefly the details of construction of the multi-flame blowpipe head, and then the correct technique of manipulating the blowpipe and welding rod. Unusual telephoto scenes show the action of the welding and preheating flames during the welding operation and the proper control of the puddle.

sales
o., St.

PERSONALS

(CONCLUDED FROM PAGE 37)

the northeastern district in 1924, and in 1931 he was appointed sales manager of that district, the position which he leaves to become traffic manager.

* * *

C. T. GREENIDGE, formerly research metallurgist with the A. O. Smith Corp., Milwaukee, has been appointed to the technical staff of the Battelle Memorial Institute, Columbus, and has been assigned to work on the new industrial project in the metallurgy of steel. C. M. HEATH, who has been identified with the metallurgical department of the American Brass Co., has been made assistant metallurgist in connection with a project in the non-ferrous field.

* * *

BYRON B. MORTON, at one time plant metallurgist at the Baton Rouge refinery of the Standard Oil Co. of Louisiana, has been added to the metallurgical staff of the International Nickel Co., New York, to work on problems involving the use of nickel alloy steel in the petroleum industry.

* * *

J. W. BRUSSEL has been named works manager of the Federal-Mogul Corp., Detroit. He held a similar position with the Timken-Detroit Axle Co. for 10 years and for the past year has been vice-president of the Wolverine Machine Co., Detroit.

* * *

LLOYD J. PINKOWSKY has been appointed purchasing agent of the Four Wheel Drive Auto Co., Clintonville, Wis., to fill the vacancy caused by the death of Guy H. Billings.

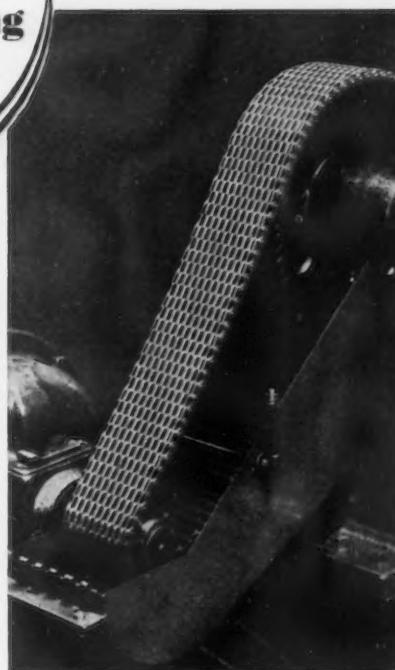
* * *

EDWARD S. ERICKSON, formerly vice-president in charge of production and research at Mullins Mfg. Co., Salem, Ohio, has become associated with the Young Radiator Co., Racine, Wis.

* * *

ERLE G. HILL, since 1930 research fellow at the Mellon Institute of Industrial Research, has joined the Lukens Steel Co., Coatesville, Pa., as director of research. After his graduation from the University of California in 1913, he took graduate work there and at Carnegie Institute of Technology and the University of Pittsburgh. In 1918 he became an instructor in mining and metallurgy at the Carnegie Institute, and two years later was made associate professor of metallurgy at the University of Pittsburgh, where he served for 10 years.

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Offices in principal cities

WHITNEY

CHAIN DRIVES

TRADE NOTES

R-S Products Corp., Philadelphia, has appointed Claud S. Gordon, 708 West Madison Street, Chicago, with branch offices in Cleveland and Indianapolis, as exclusive representative of all Ryan products in territories indicated. John R. Gearhart Co., 600 Fallon Street, Oakland, Calif., has been appointed representative in San Francisco territory.

Amerlux Steel Products Corp., New York, has removed its offices to 720 Lincoln Building, 60 East Forty-second Street.

Reliance Steel Corp., Detroit, is now operating in new warehouse at 2300 West Jefferson Avenue, having moved from Model-Friedman Steel Corp. building, with which company it has been affiliated.

Boiler Engineering Co., Newark, N. J., former builder of Beco-Turner baffle walls for water tube boilers, has discontinued business. In future, Beco-Turner baffles will be installed by Plibrico Jointless Firebrick Co., Chicago, which has added engineering and installation personnel of Boiler Engineering Co. to its boiler setting department. Plibrico company has just issued new bulletin covering Beco-Turner baffles.

Silent Chain Drives.—Link-Belt Co., Indianapolis.—Well illustrated 32-page book No. 1425, which presents Silverstreak high speed silent chain drive in terms of what it has done and can do for its users. Many

types of applications on both long and short centers are shown.

Atlas Supply Co., Inc., 35-39 Woodward Avenue, Brooklyn, has been appointed warehouse distributor of rust-resisting Toncan iron sheets produced by Republic Steel Corp. Complete stock of sheets will be maintained.

C. J. Tagliabue Mfg. Co., Brooklyn, has opened branch factory at 1916 Jackson Street, Dallas, Tex. This branch takes place of old Shreveport, La., address which has been closed. A. G. Koenig, southwestern district manager, will be in charge at Dallas.

Brooker Engineering Co., Detroit, recently organized, has established offices at 516 Marquette Building. Lester F. Brooker is president.

Thomas A. Edison, Inc., West Orange, N. J., has announced an engineering committee to coordinate the research work and engineering projects of the widely diversified Edison industries. E. D. Martin, vice-president of the company, will serve as chairman of the committee.

LaClede Christy Clay Products Co., St. Louis, has removed its Chicago district sales office to its new headquarters and warehouse at 4452 West Fifth Avenue. H. R. Hiller will remain as district manager.

Forty-seven years' experience in providing a large list
of satisfied customers with

TOOL STEEL

that is just right for the job to be done.

And we are so organized that they and you can get
what is wanted quickly.

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Detroit, Mich., 915 Harper Ave., Tel. MADison 1170-1171
New Orleans, La., 623 Commerce Street, Tel. Main 0011, Teletypewriter NO-83

Representatives elsewhere who can get in touch with you quickly

original Pittsburgh-plus system. On the economic side, he said, the NRA opinion has been that a better system from the view of fundamental economics could be set up and an improved basing point system could be devised and would be undoubtedly legal. As to the present situation, he said, the NRA view is that there is a serious question as to whether the system is not entirely legal, "which is, of course, the contention of those who have been openly operating under it for years and are perfectly willing to submit the question to the courts."

Automobile Industry Uses Single Base

Senator Barkley of Kentucky took occasion to question Mr. Richberg about the practice of the automotive industry in quoting f.o.b., Detroit, prices even though cars are carried "all over the country by truck loads at an infinitely lower cost than would be charged by freight, so that the purchaser is paying for the car as if it were carried by freight."

Declaring this to be true, Mr. Richberg said that it is also true that cars are assembled "or have been under previous practice, which I assume is still going on, at other points, but the charge, regardless, is made f.o.b., Detroit, plus freight." He went on to say that the purchaser of the car is being charged in many instances the same artificial freight so called that has been charged in effect in the case of the basing point system.

Senator King mentioned sources where steel is produced yet which are not basing points on which prices at which steel is bought are established.

Mr. Richberg spoke of this as one of the "artificialities" as a result of which NRA has insisted that basing points be added. Against that, he said, the code also provides for the allowance of the transportation charges to permit the elimination of "these artificial transportation charges in many instances."

"We have been insisting," said Mr. Richberg, who is Administration member of the steel code, "that where there was an unfair transportation charge, complaints should be made for an allowance in the transportation charge in many instances. For example, the automobile industry, a large consumer of steel, insisted upon having allowances made in transportation charges to Detroit, and in the interest of a competitive situation, to bring the plants at a distance from Detroit into competition with the plant nearer, those allowances were made."

Richberg Defends Steel Code

(CONCLUDED FROM PAGE 43)

is the sort of exaggeration of trifles, which does not indicate a very sound consideration or a mature judgment of the facts of the industry." To support his contention, Mr. Richberg pointed out that in 1929 the average price of steel, per gross ton, was \$51.42, that at no time since it has been below the April, 1933, level of \$41.96 and that after going up to \$49.77 in May, 1934, prices settled down to a level of \$47.50 during the last six months of 1934.

"In other words," said Mr. Richberg, "the price increase in the steel industry from the low of 1933 has been the enormous amount of —you will pardon my using the word 'enormous' with sarcasm, because I do not want to have it misunderstood in the record—from the amount of \$41.96 to \$47.50."

Answering a question by Senator LaFollette of Wisconsin as to the attitude of the FTC toward the basing point system, Mr. Richberg said there are two decisions of the Supreme Court holding an association operating under a basing point system was not monopolistic. He declared that this leaves the "question very much in doubt."

Explaining the difference between the multiple basing point and a single basing point system, he said:

"If you have adequate area basing points, I frankly cannot understand myself any basis upon which anyone could claim that there was anything monopolistic or artificial or unfair in such a system. It would simply be an improvement over an ordinary f.o.b. mill price basing system.

"Between those two possibilities and the present system there is a vast ground for argument as to what is simply an economic question from a business standpoint, or whether there is any legal question involved in it at all.

"It is a very difficult question to go into, and it requires a highly technical knowledge of the business to understand the effects of basing points, because they produce competitive areas in a way which can only be understood by those who have studied very carefully the effect of the basing point price quotation."

Seeking to explain the difference between the NRA and FTC reports, as requested by Senator LaFollette, Mr. Richberg said that from the standpoint of NRA there is involved both a difficult legal and economic problem, while the FTC takes a stronger position in favor of its contention that the basing point system is itself an extension of the illegality of the

British Iron and Steel Exports Are Lower—Duty Increase Expected

LONDON, March 18.—(By Cable).—Pig iron is quiet but improving, and active spring demand is expected. Exports are lower because of exchange fluctuations, but the trade agreement with Italy has been welcomed.

It is unofficially reported that the imports advisory committee is recommending an increase in iron and steel duties from 33½ to 50 per cent. Little foreign steel is

being sold here and much business in semi-finished is being diverted to British works. Finished steel is active with home demand good for railroad and structural material, but shipbuilding specifications are scarce.

The Government's £10,000,000 shipbuilding assistance scheme is effective today and the placing of numerous contracts is likely.

United Kingdom January exports of pig iron were 19,400 tons, of which 50 tons was shipped to the United States. Total exports of iron and steel were 173,000 tons. Tin plate is quiet, but numerous inquiries promise improvement.

The Continental iron and steel

markets are quiet owing to uncertainty of international organizations. The Cannes meetings achieved nothing definite regarding English participation in International Raw Steel Cartel and quota reshuffle because of Saar repatriation, and further meetings are scheduled for March 21 and 22. The International Tube Cartel has been dissolved because of break-up of Continental Tube Cartel.

The Copper and Brass Research Association, New York, has removed its offices from 25 Broadway to the Graybar Building, 420 Lexington Avenue.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese,	
export	£9
Billets, open-	
hearth	£5 10s. to £5 15s.
Tin plate, per	
base box.....	*18s. 2d. to 19s.
Steel bars, open-	
hearth	£7 17½s.
Beams, open-	
hearth	£7 7½s.
Channels, open-	
hearth	£7 12½s.
Angles, open-	
hearth	£7 7½s.
Black sheets, No.	
24 gage	£9 5s.
Galvanized sheets,	
No. 24 gage	£11 5s.

*To June 1: 18s. 5d. to 19s. 3d. thereafter.

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas.	£2 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel bars, merchant	£3 5s.
Sheet bars	£2 8s.
Plate, ¼ in. and up	£4
Plate, 3/16 in. and 5 mm.	£4 2s. 6d.
Sheets, 1/4 in....	£4 7s. 6d.
Beams, Thomas.	£3 2s. 6d.
Angles (Basic).	£3 2s. 6d.
Hoops and strip base	£4 2s. 6d.
Wire, plain, No. 8	£5 7s. 6d.
Wire nails	£5 15s.
Wire, barbed, 4-pt. No. 10 B.W.G.	£8 15s.

A SIMILAR "contest" engages the attention of the production man in charge of machining work. From a practical standpoint it is a "race" between "non-machineable" metals and tools to machine them.

In this "contest" the production man has a valuable ally in Carboly cemented carbide tools. During the past 5½ years this new tool material has met the machining requirements of many new, hard, tough alloys released from the scientist's laboratory. Alco, aluminum No. 132, centrifugally-cast iron, hard bronze alloys—these are but a few of the many metals which have been developed in the definite trend towards harder, tougher, difficult-to-machine alloys since the advent of Carboly tools.

These and many others are being successfully machined by Carboly today.

The machine shop familiar with the use of Carboly tools not only saves time and money on ordinary jobs but also is prepared to meet, more satisfactorily and more rapidly, the machining requirements of new "non-machineable" or difficult-to-machine metals.

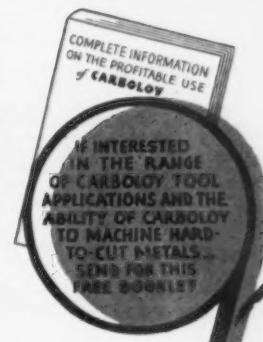
Our latest 24-page booklet, "The Profitable Use of Carboly Tools" will be of interest to all production men. Send for your copy.

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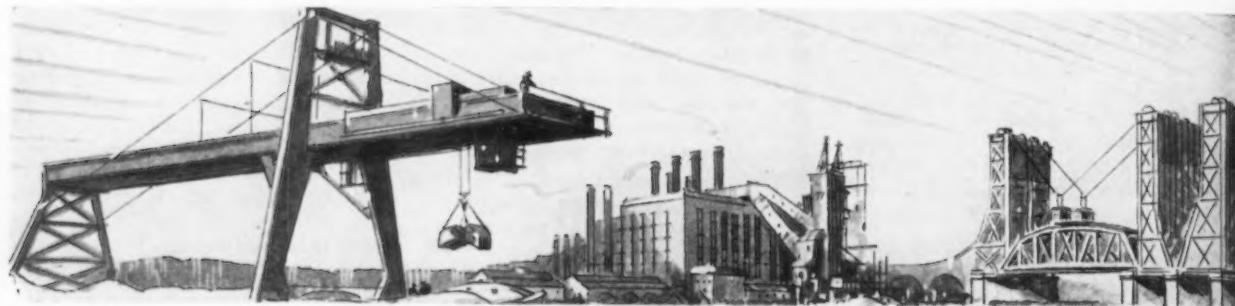
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Plant Expansion and Equipment Buying

Machine Tool Buying Adversely Affected by Business Uncertainty —Inquiry High

NEW inquiry for machine tools is still coming out in fair volume, but actual purchases seem to have been deferred slightly by last minute orders "from the front office." The Electromotive Corp. will probably ask for bids in about two weeks on the tools and equipment for its locomotive building plant in Chicago. At the moment, it appears that only special heavy presses and other equipment will be required, as standard tools may be supplied by other General Motors Corp. subsidiaries.

The automotive industry is not in the active market for tools, but some buying is being done quietly, particularly by Ford affiliates. Little intimation of equipment to be required for 1936 models is available at Detroit even though new models are to be introduced much earlier than heretofore. It now appears that model changes and consequently tool buying will be kept at a minimum.

◀ NORTH ATLANTIC ▶

Eastern Greyhound Lines, Inc., 450 Seventh Avenue, New York, has leased one-story building, 120 x 230 ft., to be erected at Thirteenth Street and Forty-third Avenue, Long Island City, for new motor bus service, repair and garage building. Cost about \$100,000 with equipment.

Superintendent of Lighthouses, St. George, Staten Island, New York, asks bids until March 27 for one 200-bhp. Diesel propelling engine, two auxiliary high pressure, motor-driven compressors, two 30-hp. vertical Diesel engine-driven air compressors, and two 7½-kw. oil engine-driven d.c. generators (Proposal 48226); 100 acetylene cylinders, 1060 cu. ft. capacity, for transporting gas under pressure (Proposal 48227).

Circle Wire & Cable Corp., Brooklyn, has been organized under direction of Harry Sena, 225 Broadway, New York, representative, capital \$250,000, to manufacture electrical wire products, cables, etc.

Department of Docks, Pier A, North River, New York, has secured appropriation of \$628,000 for purchase of mechanical equipment for new Pier 88, North River, foot of West Forty-eighth Street.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 26 for one motor-driven 3-in. spiral gear generating machine and equipment (Schedule 4522), solderless wire terminals (Schedule 4452) for Brooklyn Navy Yard; 46,000 lb. bar steel (Schedule 4505) for Brooklyn, Philadelphia and Charleston yards; 106,000 ft. corrosion-resisting steel cable (Schedule 4538) for Brooklyn and Philadelphia yards; until March 29, 18,450

lb. rough-machined steel forgings for Brooklyn yard, and like quantity similar forgings for Philadelphia yard (Schedule 4537).

Signal Supply Officer, Army Base, Brooklyn, asks bids until March 25 for 20,000 brackets and quantity of pipe bends (Circular 99).

Kelley Koett Mfg. Co., 29 East Twenty-second Street, New York, manufacturer of X-ray equipment and parts, with main plant at Covington, Ky., has leased space in building at 115-19 East Twenty-third Street, for factory branch and distributing plant.

Brown-Ozer Co., New York, recently organized, has leased one-story building at 1396-98 Third Avenue, for manufacture of store fixtures and equipment.

Outdoor Lighting Controls, Inc., 200 Central Avenue, Jersey City, N. J., manufacturer of electric control equipment and devices, has purchased three-story factory at 147-53 Booraem Avenue and will remodel for new plant.

Wilsonite Products, Inc., Allenwood, Monmouth County, N. J., has been organized by Fred Wilson, Allenwood, and associates, capital \$130,000, to manufacture iron and steel specialties.

R. J. Scott, Inc., Metuchen, N. J., Roy J. Scott, president, has taken title to former plant of Empire Floor & Wall Tile Co., on about five-acre tract, with main two-story unit totaling 220,000 sq. ft. floor space, recently acquired, and will remodel at once for new plant for manufacture of roofing products.

Petrol Corp., Forty-ninth Street and Schuylkill Avenue, Philadelphia, has acquired adjoining property, formerly owned by Hoffman Oil Co., and will use for

expansion, including another adjacent tract, secured under lease. Buildings will be remodeled and several new units erected. Cost about \$250,000 with steel tanks and other equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 26 for two headstock type lathes (Schedule 4525), one face mill cutter grinder (Schedule 4526), one horizontal hydraulic broaching machine (Schedule 4527), one milling machine (Schedule 4529), all motor driven; until March 29, motor starters for motors from 5 to 20 hp. (Schedule 4539).

Commanding Officer, Watervliet Arsenal, Watervliet, N. Y., asks bids until March 25 for 33 steel housing forgings and 36 alloy steel breech block forgings (Circular 55), 36 copper-nickel alloy forgings (Circular 56).

◀ NEW ENGLAND ▶

Quartermaster Depot, Army Base, Boston, asks bids until March 28 for six motor-driven bench grinders, one motor-driven connecting rod boring machine, four 5000-lb. jacks, one line boring tool, four motor stands, 10 bench vises and 14 creepers (Circular 96).

Wheelock, Lovejoy & Co., Inc., 128 Sidney Street, Boston, steel and alloy steel products, has leased property in Newark, N. J., for new branch storage and distributing plant.

Webley Brewing Co., Campbell Avenue, West Haven, Conn., has asked bids on general contract for two-story addition, 50 x 60 ft., to be used in part for storage and distribution. Cost about \$40,000 with equipment. Brown & Von Beren, New Haven, Conn., are architects.

Thrifty Hot Water Heater Co., Springfield, Mass., has been organized by Alfred V. Rivest, Chicopee Falls, Mass., and associates, to manufacture hot water heaters, parts and kindred products.

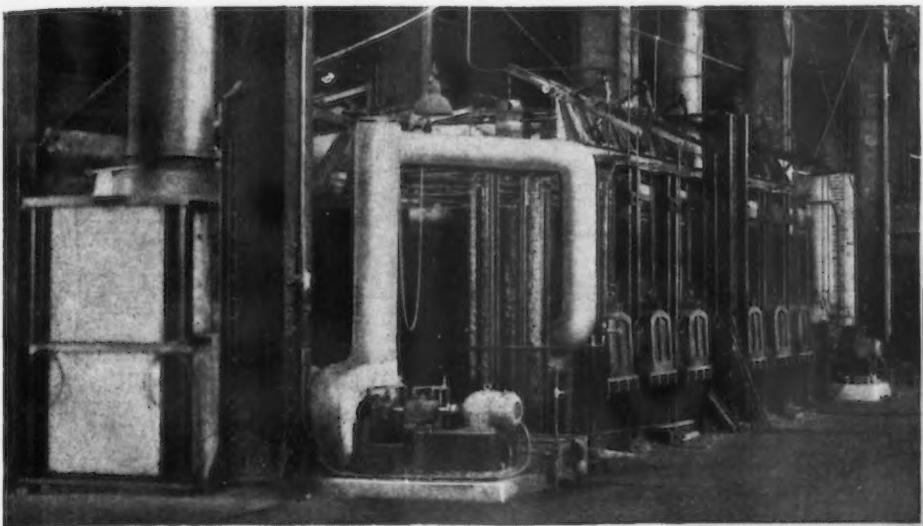
Parsons Brothers, East Washington Avenue, Bridgeport, Conn., plumbing equipment and supplies, have purchased adjoining four-story factory, and will remodel for expansion, including installation of pipe cutting and fitting shop and other mechanical departments.

◀ SOUTH ATLANTIC ▶

American Hardware & Equipment Co., 215 West First Street, Charlotte, N. C., has plans for two-story addition for storage and distribution. Cost close to \$30,000 with equipment.

Wallace Concrete Pipe Co., Columbia, S. C., recently organized by C. A. Wallace, Columbia, and associates, has taken over property at Lincoln and Tobacco Streets for new plant for production of reinforced concrete pipe. Plans have been completed for main one-story unit, 100 x 100 ft., and other structures.

Marquette Mfg. Co., N. E. Johnson Street, Minneapolis, Minn., manufacturer of garage equipment, automotive tools,



The twin chamber alloy billet heating furnace in the
Dunkirk, N. Y. Plant of Ludlum Steel Company

RECUPERATOR SAVES FUEL

at the
Ludlum Steel Company

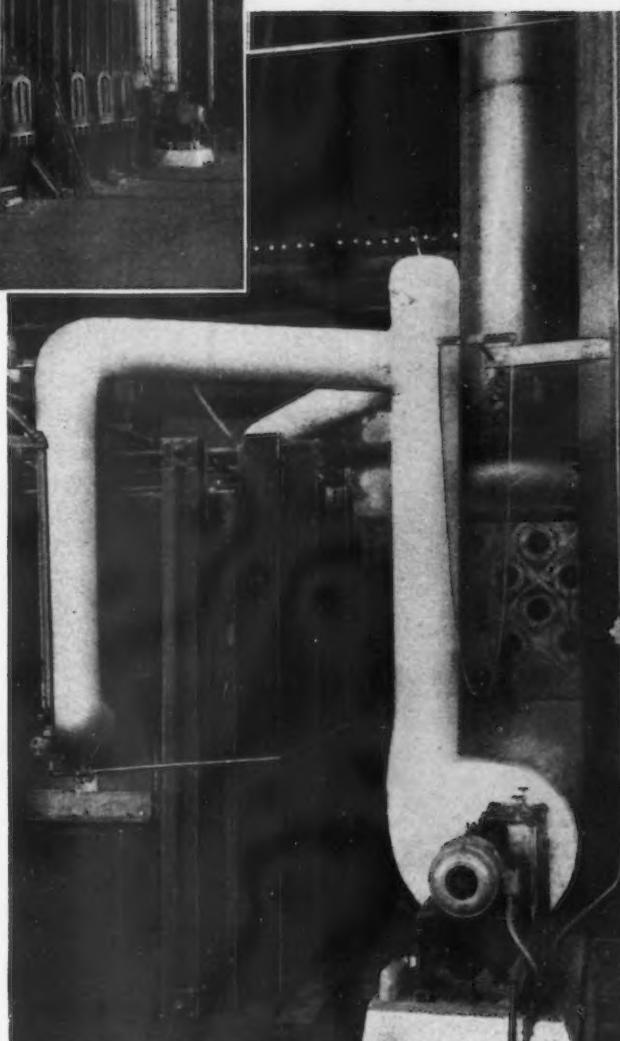
HERE ARE THE FACTS:

At the plant of Ludlum Steel Company, Dunkirk, N.Y., The Carborundum Company's Recuperators not only effect material fuel savings but also give closer control of temperature — faster heating — improved furnace atmosphere.

They operate a twin chamber alloy steel billet heating furnace. Both chambers are equipped with a recuperator, each using twenty-four tubes of "Carbofrax," the Carborundum Brand Silicon Carbide Refractory.

Air for combustion is preheated to 800° F. with the results noted above. The recuperators replace stack bases without requiring additional floor space.

The results are due to the use of the "Carbofrax" tubes—their extremely high heat conductivity—their long life—plus the perfected design of The Carborundum Company's Recuperator.



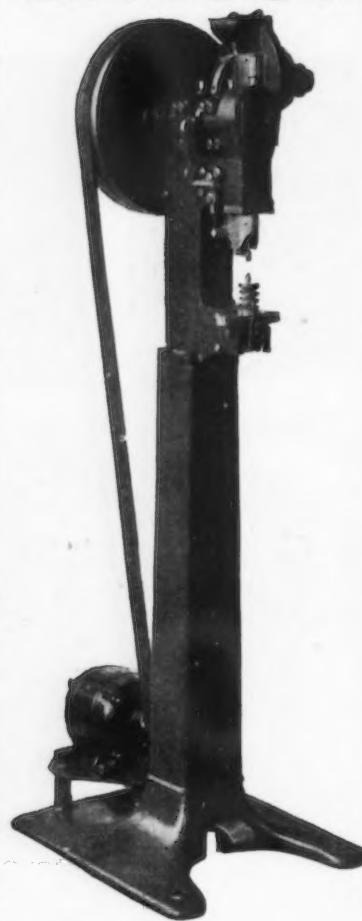
Complete engineering data giving details regarding application of the recuperators to various types of furnaces sent on request.

**THE CARBORUNDUM COMPANY'S
RECUPERATOR**
Saves Fuel and Improves Combustion Conditions

A Product of THE CARBORUNDUM COMPANY Perth Amboy, N.J.
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District Sales Branches: Boston, Chicago, Cleveland, Detroit, Philadelphia, Pittsburgh, Salt Lake City, Utah; Pacific Abrasive Supply Co., Los Angeles, San Francisco, Seattle; Denver Fireclay Co., El Paso, Texas; Williams and Wilson, Ltd., Montreal, Toronto, Canada. (Carborundum and Carbofrax are registered trade-marks of The Carborundum Company.)

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The machine that automatically feeds and sets rivets with as much speed and accuracy as tubular rivets and a 10% to 19% gain in the strength of the joint accomplished.

Let us submit samples of your work done in the "Rivitor" method.

TOMKINS-JOHNSON CO.

628 N. Mechanic Street, Jackson, Michigan

etc., plans one-story factory branch, storage and distributing plant at Savannah, Ga., where property is being secured. A similar branch factory is planned at point to be selected in Florida. Cost over \$65,000 with equipment.

◀ WESTERN PA. DIST. ▶

Board of County Commissioners, County Office Building, Pittsburgh, asks bids until March 26 for iron catch basin gratings, flat head iron wood screws, metal sign posts, tool steel, etc. Robert G. Woodside is County controller.

Brookville Coal Co., Inc., Mercer, Pa., G. W. Peterson, general manager, plans new mining plant at properties near Mercer, including tipple, hoisting, conveying

and other mechanical equipment. Cost over \$45,000 with machinery.

Westvaco Chlorine Products, Inc., South Charleston, W. Va., has plans for one-story addition for steam power and other operating service. Cost over \$60,000 with equipment. M. G. Geiger is superintendent.

A. Karg, 1143 East Second Street, Oil City, Pa., is at head of project to erect new bulk oil storage and distributing plant at Titusville, Pa., including 1000 and 5000-barrel capacity steel tanks and other equipment. Cost over \$30,000.

◀ BUFFALO DISTRICT ▶

Niagara, Lockport & Ontario Power Co., Electric Building, Buffalo, is planning rural electrification program in Niagara, Livingston, Orleans, Monroe, Wyoming and other counties, including distribution lines, substations, service facilities, etc. Cost over \$400,000.

Bausch & Lomb Optical Co., 635 St. Paul Street, Rochester, N. Y., has organized Canadian subsidiary under name of Bausch & Lomb Optical Co., Ltd., to operate a branch plant at 388 Yonge Street, Toronto, where space recently was leased. C. S. Hailauer is president of new subsidiary, and L. E. Amsden, managing director.

Spence Jewelry Co., Root Building, Buffalo, Walter M. Spence, head, manufacturer of plated metal novelties, plated jewelry, etc., has leased floor in building at 25-29 East Huron Street, for new plant.

◀ SOUTH CENTRAL ▶

Glencoe Distillery Co., Inc., 723 South Twenty-sixth Street, Louisville, has let general contract to J. F. Russell & Co., 3908 Frankfort Avenue, for new plant on Cane Run Road, including units for storage and distribution, power house and other structures. Cost over \$200,000 with machinery. D. X. Murphy & Brother, Louisville Trust Building, are architects.

Board of Education of Fayette County, Court House, Lexington, Ky., has authorized installation of manual training department in two-story addition to County school at Picadom. Obadiah Bass, 155 Walton Avenue, Lexington, is architect.

Dortch Stove Works, Franklin, Tenn., manufacturer of cooking and heating stoves and ranges, parts, etc., has plans for one-story addition, totaling about 12,000 sq. ft. floor space, primarily for storage and distribution. Cost close to \$25,000 with equipment.

Plough, Inc., Memphis, Tenn., manufacturer of chemical specialties, will take bids this month for new multi-unit plant, including power house. Cost over \$500,000 with equipment. Hanker & Cairns, 123 South Court Street, are architects; Arthur L. Nelson Engineers, 31 St. James Avenue, Boston, are mechanical engineers.

Common Council, Kosciusko, Miss., asks bids until April 2 for deep well motor-driven pumping machinery and auxiliary equipment for municipal water system.

◀ MICHIGAN DISTRICT ▶

American Metal Products Co., 6431 Edworth Boulevard, Detroit, manufacturer of welded steel tubing and kindred products, has let general contract to Bryant & Detwiler Co., Penobscot Building, for new one-story plant. Cost over \$50,000 with equipment. Giffels & Vallet, Inc., Marquette Building, is engineer.

Board of Education, Bay City, Mich., plans manual training department in new two-story and basement junior high school in eastern part of city. Cost \$700,000. Financing has been arranged through Federal aid. J. C. Goodeyne, Bay City, is architect.

Ainsworth Mfg. Corp., 2200 Franklin Street, Detroit, manufacturer of automotive products, including stampings, machined parts, etc., plans expansion and improvements, including new buildings to replace old units and remodeling of other structures, with installation of equipment. Fund of \$750,000 has been authorized for work.

Buell Die & Machine Co., Inc., Detroit, has been organized by Charles H. Buell and associates, capital \$90,000, to manufac-

ture tools, dies and kindred products. New company will take over organization of same name with local plant at 3535 Scott Street.

Keeler Brass Co., Grand Rapids, Mich., manufacturer of brass castings, hardware products and kindred metal specialties, has acquired former factory of Standardized Furniture Co., totaling about 44,000 sq. ft. floor space, and will occupy part of structure for expansion in storage and distributing division.

◀ SOUTHWEST ▶

City Council, McPherson, Kan., asks bids until March 26 for boiler and boiler feed pumps, transformers, switchboard equipment, one 40-kw. exciter set, instruments, etc., for municipal electric light and power plant. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Monsanto Chemical Co., 1700 South Second Street, St. Louis, manufacturer of industrial chemicals, plans expansion and improvements in different plants, including new buildings and equipment; also extensions in works at Monsanto, St. Louis district, and plant for production of new products. Fund of \$4,000,000 is being arranged for entire project.

S. E. Massengill Co., 208 West Nineteenth Street, Kansas City, Mo., manufacturer of industrial and other chemical products, has let general contract to Hiram Elliott Construction Co., 1016 Baltimore Street, for one-story addition, 50 x 125 ft. Cost about \$40,000 with equipment. Keene & Simpson, Land Bank Building, are architects.

Cox Steel & Wire Co., Dallas, Tex., has been organized by William Cox and H. W. Davis, 6008 Gulf Drive, to manufacture wire goods and other metal products.

Board of Education, Fort Worth, Tex., plans manual training department in new multi-story Riverside high school, for which bids will be asked on general contract in April. Cost over \$250,000. Wyatt C. Hedrick, Inc., First National Bank Building, is architect.

Texas Woolen Corp., Dallas, Tex., care of M. C. Cotton, 614 Winston Street, president, recently organized, has acquired large tract at San Angelo, Tex., for new mill, with power house, machine shop and other mechanical departments. Cost over \$400,000 with machinery.

◀ MIDDLE WEST ▶

Vulcan Stamping & Mfg. Co., 4036 West Lake Street, Chicago, manufacturer of metal containers, cans, pails, etc., has purchased one-story factory in Bellwood district, heretofore held by Chicago, Aurora & Elgin Railroad Co. Improvements will be made and equipment installed for expansion.

Quartermaster, Sixth Corps Area, Post Office Building, Chicago, asks bids until March 25 for pumping machinery and well equipment (Circular 185).

Central Scientific Co., 1644 Irving Park Boulevard, Chicago, manufacturer of precision instruments and parts, and other scientific equipment, has filed plans for three-story addition, 45 x 63 ft., for which general contract recently was let to Alfred Nelson & Son, 2432 Irving Park Boulevard. Cost over \$45,000 with equipment.

Electrical Apparatus Corp., 440 West Huron Street, Chicago, has been organized by Charles Novak and Lester Carmel, to manufacture electrical equipment and parts.

Wilson & Co., Inc., Albert Lea, Minn., manufacturer of commercial fertilizers, has let general contract to Sorenson Construction Co., Wedge-Jones Building, for one, two and three-story addition, with larger section 50 x 100 ft. Cost over \$75,000 with equipment. This is first unit of expansion program, to cost over \$400,000 with machinery.

Quartermaster Depot, 1819 West Pershing Road, Chicago, asks bids until March 25 for 2000-lb. platform scale, two weighing scales, 30-lb. capacity, counter scales, etc. (Circular 205).

Haskins Brothers & Co., 115 Hickory Street, Omaha, Neb., manufacturers of soap

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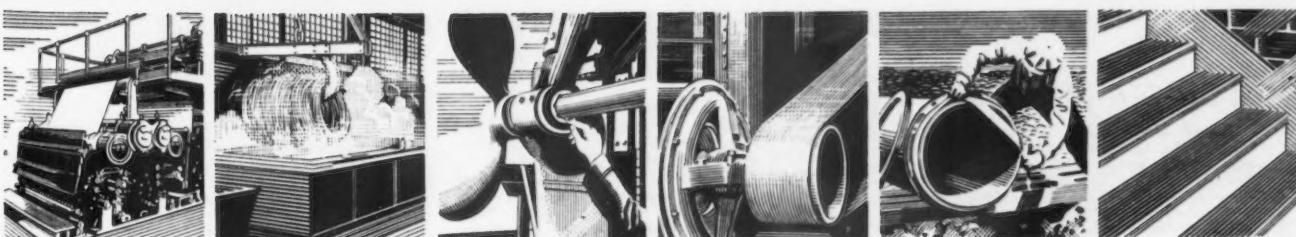
Even Time, the Junkman Respects Rubber

METAL rusted, wood rotted, fabric ruined—but the rubber window frames of these 10- and 20-year-old bodies are still flexible and soft.

In these thrifty 'thirties, the product which adds durability adds buyers. Rubber, in its new compounds developed by Goodrich, is already multiplying durability for many a product, many a processing machine.

Goodrich developed much of the science of rubber compounds on which the entire rubber industry is based. And Goodrich has continued this development until today we can give you a rubber which will flex millions of times without distortion; a rubber which will resist chemicals, heat, oil, cold; a rubber which can be inseparably attached to metal; a rubber which will absorb vibration and so quiet machinery or protect delicate instruments; a rubber which can be made tasteless and odorless and in any color and any texture from that of human skin to shark skin.

Rubber is on the march to increased use in industry—adding sales appeals, reducing costs, cutting waste. The B. F. Goodrich Co., Mechanical Rubber Goods Div., Akron, O.



Newspaper printers' rollers had always been made of a glue-glycerine combination. Now a Goodrich rubber roller outwears the traditional product by years, also saves time and cost in printing.

Rubber can be compounded by Goodrich to give almost any combination of advantages. One Goodrich compound, for lining tanks, resists heat and corrosive acids, and may last 25 or 50 years—or even longer.

Marine propeller shaft bearings formerly were made of bronze or wood, but corroded, rotted, wore away. Now Goodrich makes a rubber bearing that serves 4 to 10 times as long as the finest wood or bronze.

Leather was thought necessary for long transmission belt life. Goodrich produced a rubber belt that in hundreds of industrial uses outlasts leather, yet shows a lower first cost and lower maintenance cost.

First requirement of a gas pipe line is that the joint must not leak. Goodrich produced a coupling rubber that in local and long-distance lines have kept gas pipe joints tight for 50 years, without attention.

Goodrich compounded a rubber for stair treads that outwears stone or wood, is far safer in any weather or location, can be made in almost any attractive color desired.

Goodrich

ALL *products problems* IN RUBBER

Fig. 858

2
OF MANY
PRESSED STEEL
STYLES

Lanco Trucks

Popular all-steel trucks—handy in factory, shipping room or warehouse. No. 858 is 50" high, 11" at nose, weight 50 lbs. There are other Lanco Trucks for handling sheet steel, barrels and every form of industrial materials handling. Get the FACTS about this old reliable Lanco Line.

Ask for Pressed Steel Hand Truck Bulletin
Hand Holds of Wood

LANSING COMPANY
LANSING, MICHIGAN

New York Boston Philadelphia
Chicago Kansas City
Minneapolis San Francisco

Fig. 861

products, have awarded general contract to Peter Kiewit Sons Co., Omaha National Bank Building, for new one-story and basement machine shop, 48 x 50 ft., for which superstructure will begin at once. Cost about \$22,000 with equipment.

Bureau of Reclamation, Denver, asks bids until April 8 for one ditch cleaning and excavating machine, double crawler traction type, with endless bucket digging unit, for Rio Grande project, New Mexico-Texas (Specification 671-D).

Racine Iron & Wire Works, 901 Prospect Avenue, Racine, Wis., has placed general contract with Nelson & Son, 1550 Yout Street, for one-story shop extension, 47 x 117 ft. Cost \$25,000 with equipment.

J. I. Case Co., 700 State Street, Racine, Wis., tractors and farm implements, has bids in for reconstruction of branch house and service center at Peoria, Ill. Investment will total about \$45,000.

Village Board, Campbellsport, Wis., closes bids March 26 for erection and equipment of new waterworks plant costing \$58,000 and sewerage system costing \$60,000, both designed by Jerry Donohue Engineering Co., 608 North Eighth Street, Sheboygan, Wis. James Farrell is clerk.

◀ OHIO AND INDIANA ▶

Inland Mfg. Co., Coleman Street, Dayton, Ohio, manufacturer of automotive equipment, parts, etc., a subsidiary of General Motors Corp., is planning two one-story additions. Cost about \$60,000 with equipment. Wallace S. Whittaker is president and general manager.

Hickok Oil Corp., 2313 Madison Avenue, Toledo, Ohio, is planning expansion and improvements, including new bulk oil storage and distributing plants, extensions in present such plants in different parts of state, new service stations in Youngstown and Mahoning counties, and other structures. Cost about \$1,000,000 with equipment.

Carthage Distilling Corp., 7818 Anthony Wayne Avenue, Cincinnati, will ask bids at once on general contract for seven-story and basement addition for storage and distribution. Cost over \$200,000 with equipment.

Cleveland Metal Spray & Supply Co., Cleveland, has been organized under direction of Earl C. Krueger, Feick Building, Sandusky, Ohio, to manufacture spraying equipment and devices.

Sun Oil Co., 1608 Walnut Street, Philadelphia, has let general contract to Dawson Evans Construction Co., 5300 Carthage Pike, Cincinnati, for new bulk oil storage and distributing plant at Cincinnati. Cost about \$60,000 with steel tanks and other equipment. Local offices of company are at 1241 Chase Street.

Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until March 27 for roller bearing assemblies, annular ball bearings and radial ball bearings (Circular 565); until March 28, 8200 conduit clamps, 12,200 conduit nuts and 4100 conduit unions (Circular 578); until March 29, volt-ammeter assemblies (Circular 554), ammunition box assemblies and ammunition box mount assemblies (Circular 564); until April 3, 200 fuel pump assemblies (Circular 557); until April 4, 3400 self-locking padlocks (Circular 567); until April 5, starter assemblies (Circular 569).

United States Corrugated Fibre Box Co., 1409 Roosevelt Avenue, Indianapolis, plans one-story branch plant at Jackson, Miss. Cost over \$40,000 with equipment.

◀ WASHINGTON DIST. ▶

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until April 8 for electric grinders, electric drills, auto creepers, jacks, pliers, wrenches, lubricating guns, drills, gages, abrasive wheels, etc., totaling 100 machine and hand tools (Circular 118).

Dabney Foundry & Machine Works, Inc., Lynchburg, Va., recently organized by A. B. Dabney, 125 Easton Avenue, and associates, has acquired former plant of Hubbard Foundry & Machine Works for manufacture of iron and other metal castings, machined metal products, etc.

General Purchasing Officer, Panama Canal, Washington, asks bids until March 28 for one pipe-cutting and threading machine, one portable gasoline engine-driven conveyor, 100 heavy and 100 light manhole frames and cover, one electric portable drill, one autoclave sterilizer, one frequency changer, three single phase transformers, 12 knife switches, oil circuit breaker, 15,000 lb. track spikes, 5000 lb. track bolts, 2000 ft. $\frac{1}{2}$ -in. wire rope, cast iron pipe fittings and other equipment (Schedule 3039).

Annapolis Metropolitan Commission, Annapolis, Md., J. G. Healy, chairman, will soon take bids for pumping plant and machinery for metropolitan water system. Robert Burwell, Annapolis, is engineer.

Whitman, Reidard & Smith, West Biddle and Charles Streets, Baltimore, are consulting engineers.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 26 for one 5-ton electric crane for Washington yard (Schedule 4507); one squaring shear (Schedule 4513), one vertical universal metal-working shaper (Schedule 4515), one balancing machine (Schedule 4520), all motor driven, for Portsmouth yard.

◀ PACIFIC COAST ▶

Anglo-American Mining Corp., Mills Building, San Francisco, plans new cyanide mill at Yellow Aster gold-mining properties at Randsburg, Cal. Cost over \$85,000 with machinery. Hamilton, Beauchamp & Woodworth, Inc., 564 Market Street, San Francisco, is engineer.

Northrop Corp., El Segundo, Cal., manufacturer of aircraft and parts, has let general contract to E. S. McKittrick Co., 5905 Pacific Boulevard, Huntington Park, Cal., for one-story addition, 60 x 140 ft. Cost about \$45,000 with equipment.

Bear Creek Vineyard Association, Ampero (San Joaquin County), Cal., is planning expansion at local winery, to include new distillery, storage and distribution building, and other units. Cost about \$80,000 with equipment. Frank V. Mayo, 108 East Miner Street, Stockton, Cal., is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 29 for one sheet metal nibbler (Schedule 4516), one grinding and polishing machine (Schedule 4524), one high-speed hack saw (Schedule 4523), all motor driven, for Mare Island Navy Yard: motors, controllers, switches, hoists and spare parts (Schedule 4542); until April 2, 50,000 ft. flame-proof cable (Schedule 4533) for Puget Sound yard.

Aviation Committee, Spokane Chamber of Commerce, Spokane, Wash., is sponsoring new commercial airplane hangar, with repair and reconditioning shop, 3000 ft. wide and 100 ft. deep, at Felts Field municipal airport. Cost over \$200,000 with equipment. Eustace LeMaster is chairman in charge.

Weyerhaeuser Timber Co., Tacoma Building, Tacoma, Wash., F. R. Titcomb, general manager, has plans for new pulp mill on river front at plant at Everett, Wash., including extensions and improvements in steam-electric power plant. Cost close to \$100,000 with equipment.

Board of Regents, University of Washington, White-Henry-Stuart Building, Seattle, asks bids until April 3 for additions to power plant at institution, including two 1250-kw. turbo-generator units and accessories, condensers, switchgear, spray cooling pond equipment, switchboard, pipe lines, etc. Fund of \$142,000 has been secured through Federal aid. George H. Krueger, Douglas Building, is consulting engineer.

◀ FOREIGN ▶

Du Pont Rayon Co., Inc., 350 Fifth Avenue, New York, manufacturer of viscose rayon products, has organized new subsidiary, Ducilo S.A., Productora de Rayon, Ltd., in which Comptoir des Textiles Artificielles, Ltd., Paris, France, manufacturer of similar products, will have a substantial interest. Site is being secured near Buenos Aires, Argentina, for new mill, with power house, machine shop and other mechanical divisions. Cost over \$2,000,000 with machinery.

Brisbane Electric Light Co., Brisbane, Australia, asks bids until April 15 for one 5000-kw. turbo-alternator, complete with engine, direct-connected exciter, steam separator, surface condenser, air coupling equipment and auxiliaries.

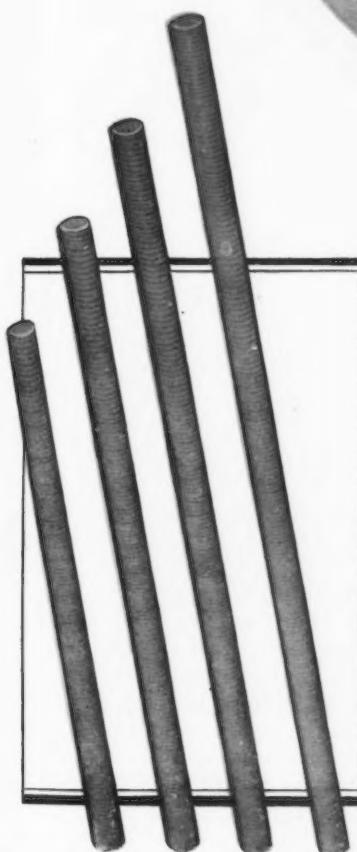
Pan-American Grace Airways, Inc., 135 East Forty-second Street, New York, has acquired tract of about 500,000 sq. meters near Lima, Peru, for new commercial airport and flying field, to include several hangars, repair and reconditioning shops, oil storage and distribution buildings, administration building and other units. Cost over \$175,000 with equipment. Company heretofore has been using Las Palmas military airport, a distance from city.

RYERSON leads again

WITH

CAST LEADED PHOSPHOR BRONZE BEARING BARS IN 6 FOOT LENGTHS

FOR Speed Production ON SCREW
MACHINES OR TURRET LATHES



Distributed exclusively in the United States by Ryerson, these Permite "speed-length" cast bars, produced by a patented process, bring you important advantages never before combined in a leaded bronze bearing stock.

IMPORTANT ECONOMIES

Economical production of *superior* bearings or parts on a screw machine or turret lathe . . . never before possible . . . is easy with the Permite 6-foot cast bars, identical in physical and wear-resisting qualities with the finest individual castings. Costly patterns, delays of molding, cleaning and core-making are eliminated. Permite bars are in stock for immediate delivery. You can keep your inventory low. And the free machining qualities of Permite bars permit maximum production rates.

SIZES AND ALLOYS AVAILABLE

Though we recommend for general bearing use the alloy of 83% Copper, 7% Tin, 7% Lead, and 3% Zinc, Permite "speed-length" bars are available in all the standard bronze alloys, in 6 foot lengths, diameters $\frac{5}{8}$ " to 2", by sixteenths. Special sizes within the above range also may be supplied.

Vast savings for users of bronze parts, and profitable new business for screw machine operators, are assured by Permite Leaded Phosphor Bronze Bars. Write today for new folder giving full information and specifications.

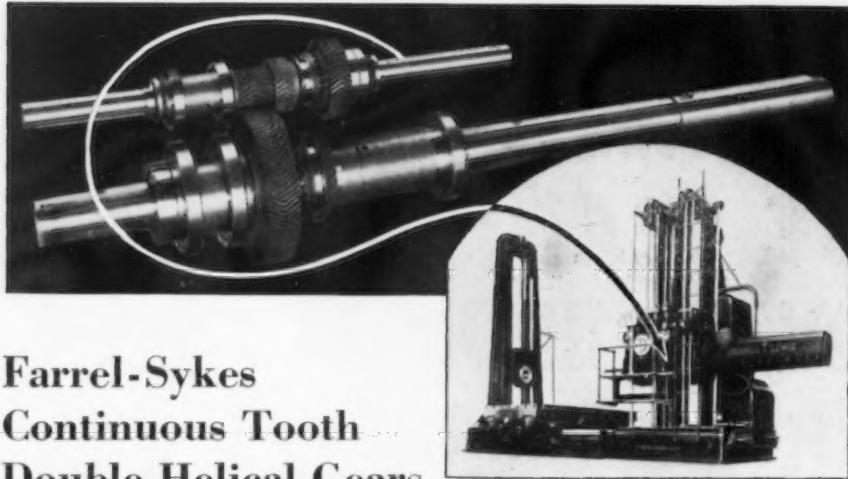
PERMITE *Leaded Phosphor Bronze* BARS

JOSEPH T. RYERSON & SON, Inc.

Plants at: { CHICAGO ST. LOUIS PHILADELPHIA
MILWAUKEE CINCINNATI JERSEY CITY

BUFFALO BOSTON

RYERSON METAL SERVICE



Farrel-Sykes Continuous Tooth Double Helical Gears Enhance Accuracy and Efficiency of Fine Machine Tools

To maintain the reputation of their horizontal boring, drilling and milling machines for "unexcelled accuracy," the Giddings and Lewis Machine Tool Co., Fond du Lac, Wis., have drawn upon the very latest and best in engineering thought and practice.

One of the refinements that has been built into these machines to give them accuracy, efficiency and smooth cutting action at all speeds and feeds is the use of Farrel-Sykes continuous tooth double helical gears to drive the main and auxiliary spindles, as shown in the illustration above. In addition, all the main drive gears are Farrel-Sykes.

Farrel-Sykes Gears are widely used by leading manufacturers

for lathes, planers, radial drills, boring machines and other machine tools. The precision with which they are generated, the accuracy of tooth division and contour, the absence of end thrust, their greater load carrying capacity and higher efficiency, their smooth, quiet operation under all conditions of service, make them ideal for machine tool applications.

We shall be pleased to show you how other machine tool builders use Farrel-Sykes Gears and to have our engineers work with you on their application to your machines.

*For further information please address
FARREL - BIRMINGHAM
COMPANY, INC.
333 Vulcan St., Buffalo, N. Y.*

FARREL-SYKES "The Gear With a Backbone"

Old Age Pensions

(CONTINUED FROM PAGE 23)

figures for 14 states whose pension plans have been in effect sufficiently long to provide such data. In this connection it should be pointed out that the State pension systems are all non-contributory;

that is, the entire cost of maintaining the system is borne by the state or the county, or by both.

Pension Cheaper Than Poorhouses

Of unusual significance in a determination of the relative economies of pension plans as compared with poorhouses as a means of caring for dependent aged per-

sons are the figures supplied by a number of states for their poorhouse relief costs. (See Table 1.) Of the 22 states for which this information was available, nine had an average cost per month per inmate between \$40 and \$50, in four states it was between \$50 and \$60, in four states between \$30 and \$40, and in two states less than \$30, between \$60 and \$70 in one state, and over \$70 in the two remaining states.

Comparison of poorhouse costs and pensions is possible for 11 of the states. The average cost of poorhouse relief per inmate compared with average cost per pensioner ranged from 1.7 times to 5.6 times as much. The arithmetical average of the 11 ratios was 3.1 times. In four states ratios were above this average. This evidence helps to explain the unusual amount of legislative activity with regard to pension laws.

Every state except New Mexico has almshouses and in 40 of them they are owned and administered by the counties. In a study of almshouses in 1925 by the United States Bureau of Labor Statistics, covering 2183 institutions—93 per cent of the total—there were found to be 85,889 inmates, housed in institutions which had cost 150 millions—\$1,750 for each inmate—and were costing an average of \$335 per year per inmate to run. Other studies show that for every dollar spent on almshouses only 31 cents goes to actual maintenance of the aged, the rest being spent for administrative costs.

What would be the costs of the plans now offered for legislative consideration? No actuarial background can be adduced to provide cost comparisons for these plans, but the proposed plans themselves offer a basis on which costs of operation can be estimated with reasonable accuracy.

The Townsend Plan

The old age pension plan of Dr. P. E. Townsend is alleged to have the support of some 20 million citizens. The proposal is simple. Every person 60 years old or more may receive for life a pension of \$200 per month under the following conditions: (1) that he give proof of never having been a criminal (sic); (2) that he promises to spend the \$200 during the month in which it is received, and (3)

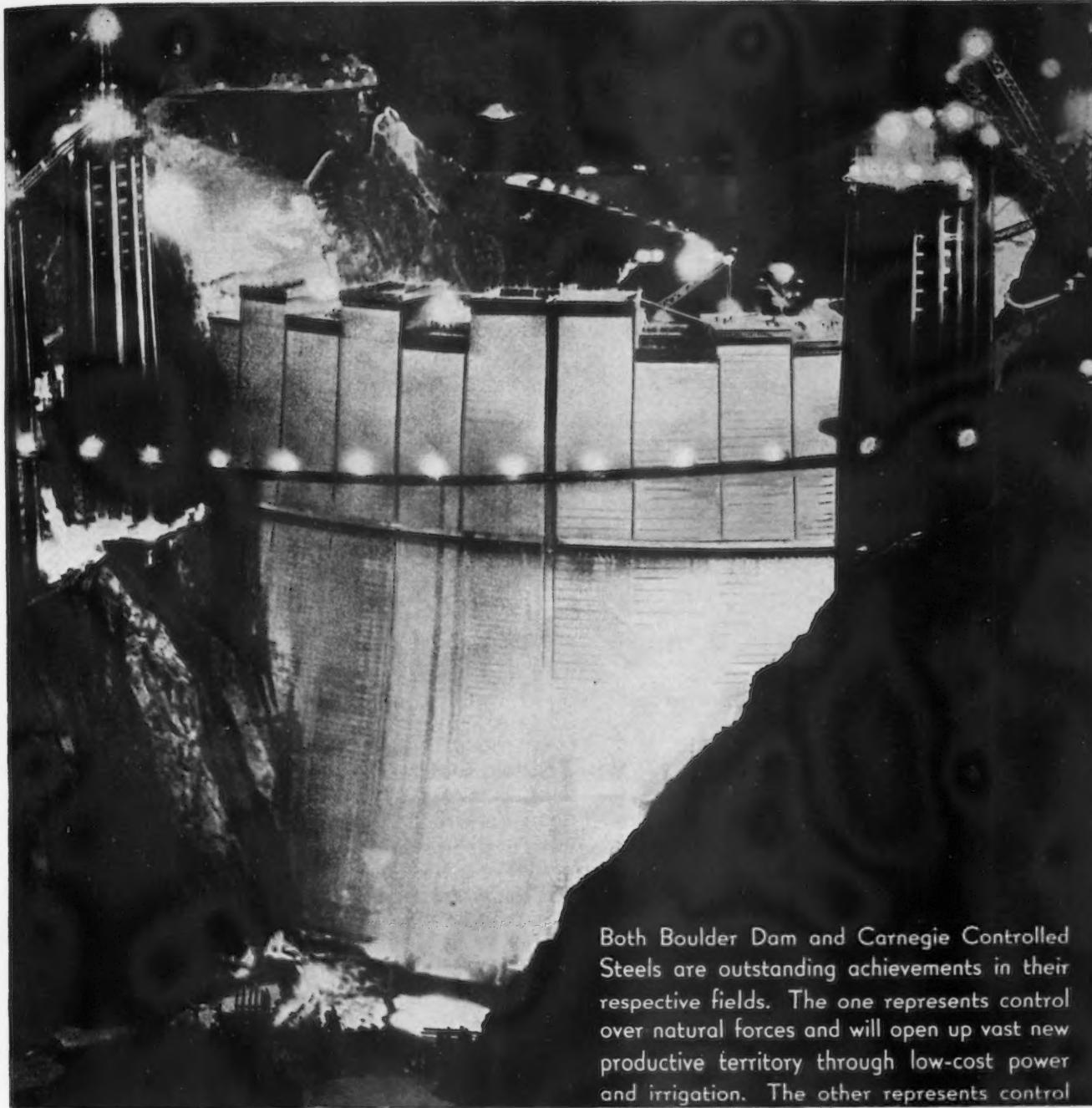
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CARNEGIE Controlled STEELS

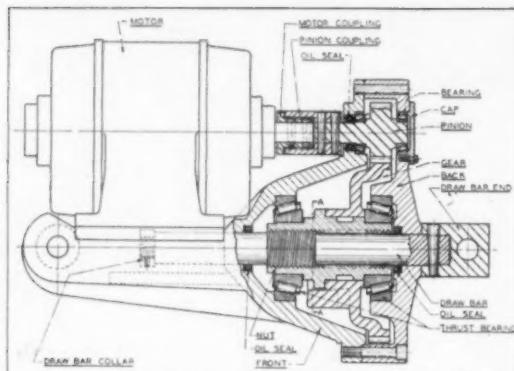
PRODUCT OF CARNEGIE STEEL COMPANY • PITTSBURGH
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307

United States Steel  *Corporation Subsidiaries*

PULL-PUSH POWER

ELECTRICALLY OPERATED STRAIGHT LINE POWER UNIT



DESCRIPTION:

The power load is carried at equal speed in either direction.
The time cycle is based on a 4" stroke in one second.
Lifting power 160 to 2300 lbs.
Impelling force 3000 to 35,000 lbs.
All moving parts in oil bath.
Cost of current practically nothing.
Standard housing can be of base, clevis, or flanged type.

ASK FOR BULLETIN No. 127

Other Products: Hand Operated Lathe Chucks—Catalogue 48.
Power Chucks—Bulletin 120C. Power Wrenches—Bulletin 138.

THE CUSHMAN CHUCK COMPANY, HARTFORD, CONN.

(CONTINUED FROM PAGE 76)

that he refrain from all productive or gainful occupation.

When the cost of the plan and methods of financing it are considered not even Dr. Townsend seems to be very clear about it. The cost is easy to estimate. Based on 1930 census data there are now about 10 million persons in the United States who are 60 years old or more. Assuming that none of them would refuse an offer of \$200 a month to stop work, the cost of the plan would start at \$24 billion a year, the size of the national debt two years ago.

The author of the plan is not very specific on the method he proposes to finance the plan except that it will be a Federal tax which will replace all similar state and local taxes. In the original plan the implication was that a retail-sales tax would be used. When statisticians pointed out that total retail sales even in 1929 were only \$49 billion and that it would require a 49 per cent tax on them to

PURPOSES:

Vises, Clamping Fixtures, Arbor Presses, and Jacks.
Power Clamps for shears and welding machines.
The moulding presses of plastic materials such as bakelite, rubber, clay, etc.
Die casting machines—for die movement and drawing cores.
Industrial doors—to open and close.
Many other purposes.

1929 place the value of all business transactions at \$1,208,000,000,000—\$1.2 trillion, \$1,208 billions, or \$1,208 million million, a fairly large sum. A tax of 2 per cent on this sum in 1929 would have provided revenue of \$24 billion, enough to finance the Townsend plan.

Doctor Townsend avoids any definition of his latest term "business transactions" but it must be made to include every transfer of ownership or control of money or credit if sufficient revenue is to be provided by the tax proposed to finance his plan. Each payment of wages is a business transaction and would be taxed as would each payment for rent, food, clothing and all other goods and services which are exchanged. But this is still only the early stages of the tax. To coin a new term to describe this proposal, it would result in "compound multiple pyramiding" of taxes back to the ultimate raw materials.

The Wagner Plan

The plan most likely to receive ultimate Congressional approval—although probably not in its present form—is that embodied in the Wagner Social Security Bill. The section of this bill dealing with old age pensions includes all employees of the country, whether wage earners or salaried workers, except employees of governments and of railroads, the latter now covered by a Federal pension law. Joint and equal contributions to

(CONTINUED ON PAGE 80)

provide the \$24 billion needed for the plan, the author intimated that he really meant a tax on all business transactions. Here was a real source of revenue for estimates for

TABLE I—COST OF PENSIONS—1932

State-Wide Mandatory Systems

State	Total Cost 1932	Cost per In- habitant	per \$1,000 of Taxable Property	Average Pension per Month	Poorhouse Cost per Month
Arizona	\$200,927	...	...	\$22.81	\$41.78
California	3,508,324	\$0.62	\$0.40	21.16	44.74
Colorado	171,130	...	...	7.69	42.30
Delaware	189,550	.80	.67	9.82	Abolished
Idaho	131,099	.38	...	8.50	47.26
Massachusetts	5,411,723	1.27	.75	25.02	37.94
New Hampshire	199,174	.43	.29	19.90	44.19
New York	13,591,419	1.08	.46	20.58	35.80
Wyoming	94,297	.45	...	11.69	78.74

County Optional Systems

Maryland	\$50,217	\$0.06	...	\$29.35	\$40.89
Minnesota	417,325	.39	...	13.80	56.29
Montana	154,929	.43	...	12.51	55.19
Utah	99,031	.29	...	8.15	45.62
Wisconsin	423,003	.41	...	19.52	21.70
Total-Average	..\$24,642,148	\$0.81	...	\$19.34	\$39.37

BETTER PARTS *at* LOWER COST!

MACHINING OPERATIONS ARE MINIMIZED

LABOR IS ECONOMIZED

WEAR ON TOOLS IS REDUCED

Try out seamless tubing in your shop and find out for yourself what you can do with it in making parts. Be satisfied, at least, that you have given this material a trial in the interest of economy and a better finished product. NATIONAL-SHELBY Seamless Tubing comes in practically any size and wall-thickness which you will require and in various shapes to save you operations. Grades and treatments of steel are furnished to meet almost any use. To use seamless mechanical tubing for making parts is to be up-to-the-minute in efficient manufacture and cost saving. Sometimes just a single cut or light grinding may be all that is needed to make your part, or perhaps simple swaging, expanding, or upsetting, either from hot-finished or cold-drawn tubing. The finished part will be of fine, uniform steel structure with exceptional strength and no excess weight.

Why not send in your blue print or specification and let us consider your problem? It may result in better parts for you and at lower cost. Also, send for Seamless Handbook.

NATIONAL TUBE COMPANY • Pittsburgh, Pa.
Pacific Coast Distributors—COLUMBIA STEEL Co., San Francisco, Calif.
Export Distributors—UNITED STATES STEEL PRODUCTS Co., New York, N. Y.

United States Steel Corporation Subsidiary

NATIONAL-SHELBY SEAMLESS MECHANICAL TUBING



*Some of the things you
can do with NATIONAL-
SHELBY Seamless Tubing*

TWIST IT	BEND IT
WELD IT	COIL IT
THREAD IT	UPSET IT
MACHINE IT	TEMPER IT
GRIND IT	FLANGE IT
SWAGE IT	EXPAND IT
COAT IT	FLATTEN IT



Shock . . . stress . . . wear . . . the triple threat that is ever-present in the constant clashing of gears.

Resisting these severe hazards in the "daily grind" of service, demands a gear steel of toughness and temper, plus uniformity of grain and texture—for a gear is only as strong as its weakest tooth.

In many difficult applications, gears cut from B & L Cold Drawn Steel have shown unusual ability to stand hard punishment. They can often be substituted for cast or forged gears with advantages of greater economy and longer life.

Gear steel for specific uses is developed from B & L special alloy stock to insure not only strength but also good machining qualities—with minimum distortion after heat treatment, so that you can secure the precision necessary for quiet-running gears.

If you have an involved problem in gear manufacture, why not avail yourself of the experience and cooperation which B & L engineers are always ready to give you?

This Clash Gear for the pinion of a starting mechanism is cut from B & L Cold Drawn Steel. Its service life is more than satisfactory.

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WIDE FLATS • SPECIAL SECTIONS •
ALLOY STEELS

BLISS & LAUGHLIN, INC.

HARVEY, ILL. Sales Offices in all Principal Cities BUFFALO, N.Y.

(CONTINUED FROM PAGE 78)

the pension fund are required by employers and each employee. Later developments contemplate the elimination of agricultural and domestic service labor from the operation of the act because of the cost of supervision and collection.

From Jan. 1, 1937, when the law would be effective, employers will

contribute one-half of 1 per cent of their total payrolls and employees one-half of 1 per cent of their earnings. In 1942 the contributions of each contributing group increase to 1 per cent, and each five years thereafter a similar increase in the rate of contribution is required, until in 1957 each group contributes two and one-half per cent.

Complete information is lacking for an accurate calculation of what this plan would cost the employers and employees of the nation, and any estimate based on experience admittedly is not a sure guide for the future.

It will be useful perhaps, and certainly interesting, to make some sort of estimate of what it would cost under certain specified conditions. Table 2 shows the result of this attempt. Figures used are taken from the recent report on national income made by the Department of Commerce, which is the most complete and nearly accurate study of its kind ever made.

In Table 2 are shown the total wages and salaries paid out in 1929 and 1932, the total income paid to owners of business as dividends and as entrepreneurial withdrawals, the contributions required annually if employers and employees were each assessed 1½ per cent, a total of 3 per cent, and the proportion such contributions are to business income paid out. There are some discrepancies in these figures but their net effect upon general conclusions is probably small. The largest source of error is that employees of railroads included in the Federal Railroad Pension Law are excluded from the Wagner Bill, as are all government employees.

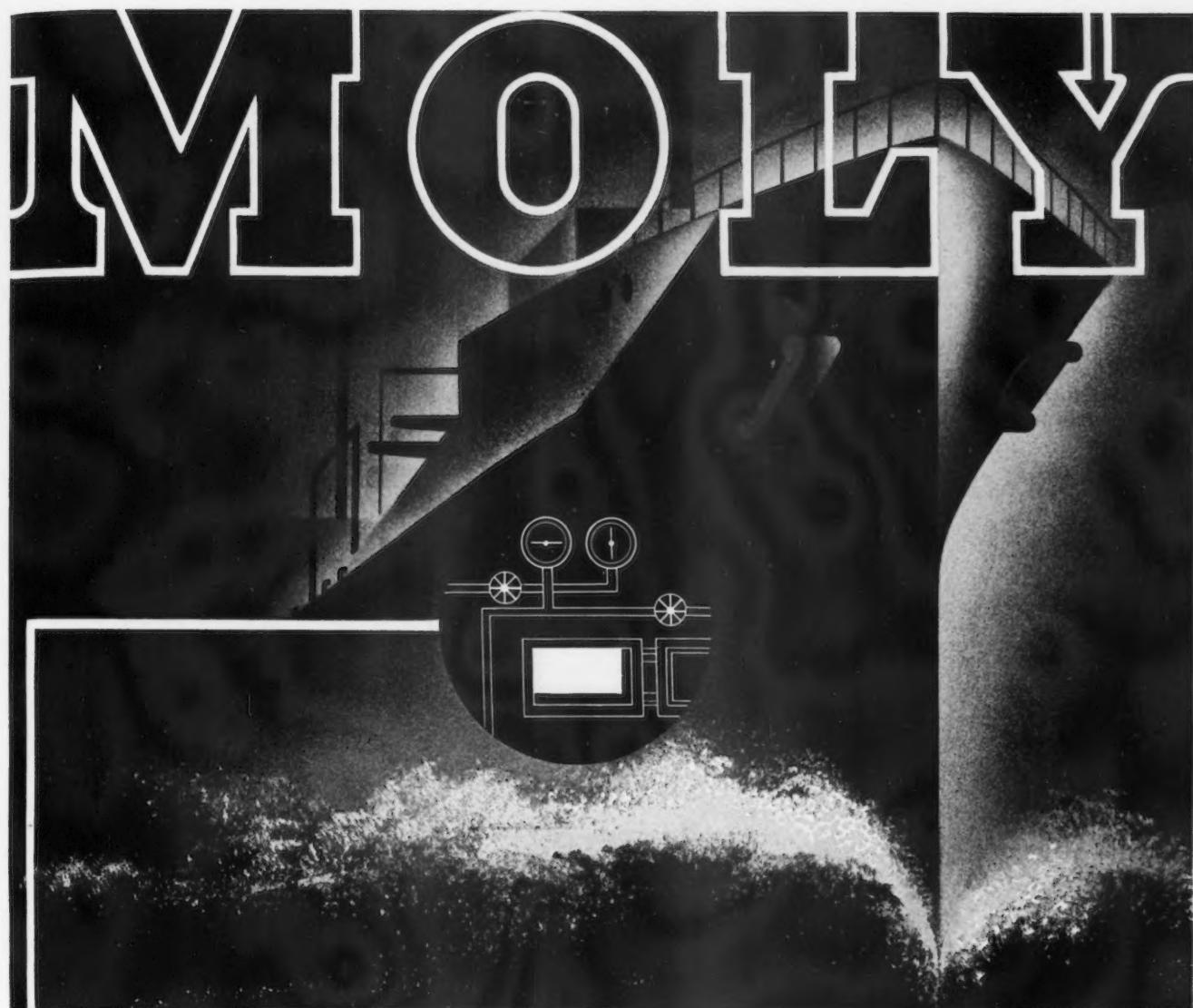
Cost of Wagner Pension Plan

During 1929, the 10 great groups into which the economic activities of the nation are divided, plus a miscellaneous group, paid out \$47,809 million in wages and salaries, and \$27,541 million in 1932. During these two years the owners of American business paid themselves \$20,183 million and \$11,116 million respectively.

Now, if employees and employers had each contributed 1½ per cent of their earnings and payrolls to a pension fund, total contributions would have been \$1,435 million in 1929 and \$826 million in 1932. Total contributions would amount to 7.1 per cent and 7.4 per cent respectively of the income received by owners of business.

The facts themselves indicate that a tremendous injustice will be done to a number of industries under any pension plan based on a flat contribution rate cutting across wages and salaries earned and

(CONTINUED ON PAGE 82)



Moly gives vitality to high-temperature steels

PICTURE the boilers of a modern destroyer splitting the sea at top speed. Or those parts under the heavy pressures and temperatures of oil-refinery requirements. . . . "Moly" gives their steel the extra quality to meet extraordinary demands.

Not only is Moly the most effective economical element for raising the creep strength of steel. But it also prevents temper embrittlement, reduces blue brittleness, and intensifies the corrosion-resisting properties imparted by other alloying elements.

Example: A low carbon steel containing from 4.6% Chromium gives good corrosion resistance in oil-refining service. The addition of only .50% Molybdenum has been found to improve greatly this desirable quality and to result in increased recovery in the foundry as well as in the added virtues mentioned above.

While there are various types of steels in

commercial use for which creep strength claims are made, the ones that grow in popularity are invariably those containing Moly. The effects of Molybdenum are so remarkable that there are today several foundries which, to insure the retention of their good reputation, insist on adding Moly to their steels of this type.

Keep posted on the rapid progress of Molybdenum. Let us put you on the mailing list of our periodical house organ, "*The Moly Matrix*." A simple post-card request is all that is necessary. Write also for these interesting books: "*Molybdenum in 1934*" and "*Molybdenum in Cast Iron — 1934 Supplement*." And, if you've an alloy problem of your own, our metallurgists and Detroit experimental laboratory are at your disposal in solving it. Climax Molybdenum Company, 500 Fifth Avenue, New York City. (In Canada: Railway & Power Engineering Corporation, Ltd.)

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5 and 10 per cent, and was above 10 per cent in manufacturing, transportation, finance and, of course, in construction.

The 3 per cent contribution rate used in this analysis would be the rate called for under the Wagner Bill from 1947 to 1952. For the first five years of operation of the plan, total contributions would be one-third of those given in Table 2, and two-thirds during the second five-year period.

Knee Action Manufacture Refined

(CONTINUED FROM PAGE 29)

to fit the extruded flanges on the king-pin yoke forging. The yokes are joined to the supports by flash welding, reinforced by arc welding.

Each support is then checked in an inspection fixture, typical of other new fixtures, in which it is exactly located by air-operated clamps. The chief aim here is to insure that the length is correct and that the attached yokes are aligned in the same plane. The use of newly devised attachments in the welders this year has reduced to 5 per cent the number of supports that require straightening after this test.

The conveyor now carries the supports to the normalizing oven, which has been increased in heating capacity to take care of the greater mass of material in this year's heavier supports.

In an 800-ton coining press, the largest in the plant, all surfaces of the entire unit are now formed to correct shape. This press, despite its immense weight, is equipped with pneumatic toggle brakes that will stop it instantly, although, it is said, so much energy is stored up in the rotating parts that, if the power be cut off, they will continue to run for two hours unless the brakes be applied.

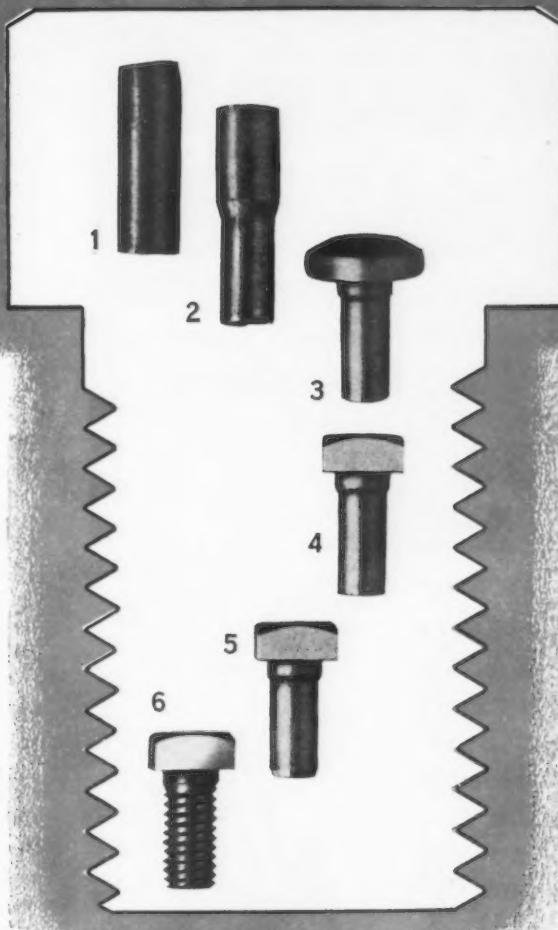
Unique Hydraulic Straightener Used

On another new air clamp fixture, the support is inspected for straightness, alignment, and caster and camber angles. Corrections are made in a unique hydraulic straightener (one of four built by Williams & White for Chevrolet),

TABLE II—THREE PER CENT PAYROLL TAX APPLIED AGAINST PROFITS								
Industry	Wages and Salaries Paid		Paid to Owners		Contributions at 3 Per Cent of Payroll		Per Cent of Contributions to Profits	
	1929	1932	1929	1932	1929	1932	1929	1932
Agriculture . . .	\$1,313	\$523	\$4,546	\$2,481	\$39.4	\$15.7	0.9	0.6
Mining	1,639	677	1,312	667	49.2	20.3	3.7	3.0
Electric light power and gas . . .	531	384	739	578	15.9	11.5	2.2	2.0
Manufacturing . . .	14,984	6,961	3,161	1,288	449.5	208.8	14.2	16.2
Construction . . .	2,620	689	76	6	78.6	20.7	104.5	345.0
Transportation . . .	4,970	2,867	1,143	582	149.1	86.0	12.9	14.7
Communication . . .	713	542	172	207	22.1	16.3	12.9	7.9
Trade	8,209	5,597	3,027	1,688	246.3	167.9	8.1	9.9
Finance	3,246	2,243	923	490	97.4	67.3	10.5	13.7
Service	5,932	3,713	2,480	1,497	178.0	112.1	7.2	7.5
Miscellaneous . . .	3,652	3,345	2,604	1,632	109.6	100.3	4.2	6.1
Total	\$47,809	\$27,541	\$20,183	\$11,116	\$1,435.1	\$826.9	7.1	7.4

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gives increased production . . . improved quality



The high quality of J&L Cold Heading Wire is due, not to some *one* unusual factor, but to the painstaking care which Jones & Laughlin devotes to *all* the factors which enter into the manufacture of this product. We have helped many users of cold heading wire to obtain greater yield and better quality. May we consult with you concerning your application problems?

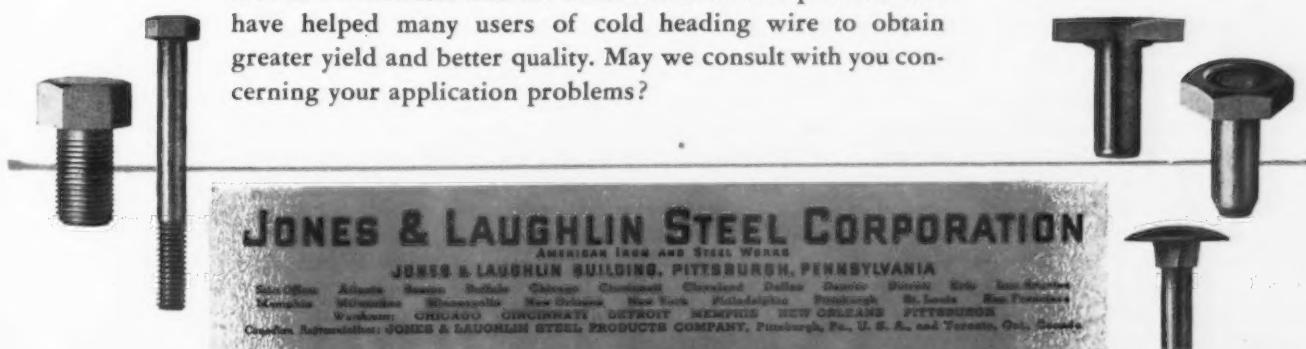
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• **Above:** A Greenlee special machine, for a car builder—Oilgear Fluid Power Feed equipment helps secure the desired production.

• **At Right:** A new Oilgear Fluid Power Feed. Note: Flanged mounting, as integral machine part . . . Inside pump eliminating hazard and bettering appearance . . . Self-contained; auxiliary valves, tubing, etc. are integral with pump . . . Many other exclusive features.

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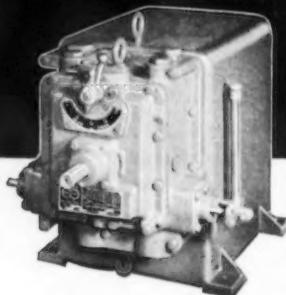
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OILGEAR FLUID POWER FEEDS

(B-1202)

instead of by laborious hand methods formerly used. The piece is fixed in position by hydraulic clamps, controlled by a light lever. Four other levers, two at each end, control the hydraulic pressure that bends or twists the support as required. Each operator, one at either end, has two indicators to guide him, a set of colored electric lights and a pair of wedge-shaped sights. Both indicators, when the

piece is clamped down, show if the support is either bent or twisted, and tell the operator in which direction the hydraulic pressure must be applied to correct the error. Quick-acting valves permit the operator to make extremely small corrections, effecting the changes gradually, until the lights or the sights indicate that straightness has been attained.

Another interesting machine of

special design is used on the next operation, the surface broaching of the upper bearing surface of the support to effect an accurate seat when the support is assembled to the chassis frame side rails. Both seats are broached at once. The tools operate vertically, each moved independently of the other with a hydraulic drive exerting a 10-ton load. The cutters, having 35-in. stroke, are 3½ in. wide. The diagonal teeth slope in opposite directions, balancing the side thrust on the work.

A basic improvement in finish this year is that the holes for the bolts by which the king-pin support is attached to the chassis, instead of being punched as last year, are drilled in jigs. Three special machines drill 21 holes at once, by means of three groups of drills in separate multiple heads advanced horizontally by hydraulic feed. Another machine drills multiple holes in the angular faces of the support.

King-pin holes in the yoke forgings are drilled in a massive four-station machine. Eight horizontal drills operate at once, four on each side of the vertical rotating fixture in which the supports are clamped. The finished support is removed and another clamped in place while work is being done on two other supports in the machine.

A new operation this year is the milling of a slot inside the king-pin hole of the yoke, designed to receive a lock spring retainer. A battery of five Hall planetary double-end milling machines is used.

A final inspection, after all machine operations, precedes the assembly operation in which the king-pin support receives its two knee-action units. The support is accurately located in the inspection fixture by air clamps. Close-fitting gage pins, corresponding to the king-pins, are inserted through the yokes and their inclination (which determines caster and camber in front wheels) is tested in two planes by triangular gages, which slide in slots in the bed-plate. In the fixture are horizontal sliding gage pins which must register with the drilled holes by which the support is bolted to the chassis. Close by is one of the special hydraulic straightening machines, used exclusively for corrections shown necessary by this final inspection.